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BIRDS AND MAMMALS OF THE SKEENA RIVER REGION OF NORTHERN BRITISH COLUMBIA

BY

HARRY S. SWARTH

UNIVERSITY OF CALIFORNIA PUBLICATIONS IN ZOOLOGY
Vol. 24, No. 3, pp. 315–394, plates 9–11, 1 figure in text

UNIVERSITY OF CALIFORNIA PRESS
BERKELEY, CALIFORNIA
1924

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ZOOLOGY.—C. A. Kofoid and J. Grinnell, Editors.

This series contains the contributions from the Department of Zoology, from the Marine Laboratory of the Scripps Institution for Biological Research, at La Jolla, California, and from the California Museum of Vertebrate Zoology in Berkeley.

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Issued January 24, 1924

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(Contribution from the Museum of Vertebrate Zoology of the University of California)

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INTRODUCTION

In pursuance of the plan of zoological exploration which the Museum of Vertebrate Zoology, since its inception, has had under way in northwestern North America, a field trip was made into that region during the summer of 1921. The expenses of this trip, as of the preceding ones, were defrayed by Miss Annie M. Alexander, whose interest in the zoology of the northwest was the determining factor in directing the activities of the Museum toward that part of North America. The locality chosen for the 1921 expedition was the valley of the upper Skeena River, northern British Columbia, centering at the town of Hazelton. Our party consisted of two, the writer and one assistant, Mr. William Duncan Strong, a student at the University of California. The material collected consists of 265 mammals, 687 birds, and 50 reptiles and amphibians.

Acknowledgments are due to several institutions and individuals for aid, both in prosecution of the field work and in the subsequent studies of the material collected. From the Dominion Parks Branch, Department of the Interior, Canada, and from the Game Conservation Board of British Columbia, Vancouver, permission was received to

collect birds. I am under obligations to the Bureau of Biological Survey of the United States Department of Agriculture, through its chief, Dr. E. W. Nelson, for the loan of specimens and for the identification of certain mammals. To the Victoria Memorial Museum, Ottawa, through Mr. P. A. Taverner, ornithological curator, and to the Provincial Museum, Victoria, British Columbia, through the director, Mr. F. Kermode, I am indebted for the loan of many specimens.

To Major Allan Brooks, of Okanagan Landing, British Columbia, I am under obligations for the loan of specimens, and for critical comments and advice bearing upon my treatment of various species of birds and mammals. Major Brooks also made the drawing of the tail of the rock ptarmigan that is shown herewith.

Plant names used in this report were kindly supplied by Professor W. L. Jepson, of the University of California, based upon specimens collected.

In treating the birds the nomenclature used is that of the American Ornithologists' Union *Check-List* (1910) and its supplements (1912, 1920), with such modifications as I employed in my "Birds and Mammals of the Stikine Region" (1922, p. 127).

ITINERARY AND DESCRIPTIONS OF LOCALITIES

We reached Hazelton the evening of May 25. On June 20 we removed to Kispiox Valley, twenty-three miles north of Hazelton. On July 15 return was made to Hazelton, and several days devoted to packing specimens and preparing for a mountain trip. On July 21 we ascended Nine-mile Mountain. On August 14 we returned to Hazelton, and on August 16 to Kispiox Valley. Final return to Hazelton was made on September 17; on September 19 Strong took the train for home, and on September 26 the writer took his departure.

Hazelton

The town of Hazelton is at the junction of the Skeena and Bulkley rivers. The railroad station (Grand Trunk Pacific R. R.), some two miles to the southeast, is 177 miles from the coast, at Prince Rupert, and 973 feet above the sea. The town is in the low bottom lands through which the rivers flow. On either side of these bottom lands steep bluffs rise, two hundred feet or more, above which the higher

plateau slopes gently upward toward the several nearby mountain ranges. The most conspicuous of these, the towering, rocky peaks of the Rocher Déboulé, ten or twelve miles to the southeast, rise precipitously to elevations of more than 8000 feet.

In the bottom lands poplar (*Populus tremuloides*) is the dominant forest growth, covering many square miles in almost pure stands of dense woods. Along the river there are rows of large cottonwoods, and on the ridges thickets of hazel, the abundance of which probably gave the town its name.

The higher slopes and plateaus, above the river bottoms, were once thickly covered with Engelmann spruce (*Picea engelmanni*), but these areas, at least toward the southeast, have suffered repeatedly from forest fires, so that but remnants of the woods remain standing. The ground beneath is strewn with charred trunks, hidden during the summer months by fire weed and bracken; and partly burned trees remain erect at scattered intervals. The plateau region is drained by numerous small streams, bordered with thickets of willow and alder. At rather frequent intervals there are muskegs, usually unaffected by fire, and affording contrast in several respects to their more monotonous surroundings.

These muskegs, often roughly circular in shape, are of varying size, marshy, with deep, sticky mud, or sometimes a few inches of water, and with mud and water usually concealed by grass. Scattered over them are a few funereal black spruces (*Picea mariana*), festooned with streamers of black moss. The bordering forest of Engelmann spruce usually forms a ring of denser growth than elsewhere about the margin of the muskeg, where, with the spruce, are mingled a few red cedars (*Thuja plicata*).

Toward the base of Rocher Déboulé, there are places where red cedar grows in some abundance. Mostly these trees had been cut out years before, but some groves remain, and in these clumps of cedars and in the muskegs species of birds are breeding that are not seen elsewhere at the same altitude.

Our camp in this region was on the opposite side of the Bulkley River from Hazelton, on what is locally known as Mission Point. Mammal trapping was carried on in the bottom lands between the Bulkley River and the railroad.

Kispiox Valley

The Kispiox River empties into the Skeena about ten miles north of Hazelton. Our camp in Kispiox Valley was at Beirnes' ranch, twenty-three miles north of Hazelton. The whole valley at that point is of much the same nature as the bottom lands near Hazelton; there is no such extent of spruce forest as is seen in the burned-over areas toward Rocher Déboulé. The forest is mainly of poplar, large sized trees with the dense underbrush that accompanies this growth. Scattered spruces occur everywhere, sometimes little clumps of them, but no extensive stands. Lodgepole pine also occurs in limited amount. In the lower Kispiox Valley there are large areas occupied almost solidly with this pine, small trees in dense groves. The region we covered in Kispiox Valley, though all in the poplar-grown bottom lands, offered a greater variety of conditions locally than is usually the case in this environment. There are many clearings in the woods, mostly pertaining to small ranches that have been abandoned. Along the river are wide expanses of open fields and pastures, some of this cleared land, some of it marshy stretches supporting no growths larger than thickets of willow and spiraea. Many little streams intersect forests and fields, some of these rivulets heading from small lakes buried in the thick woods.

Along the Kispiox River are occasional groves of cottonwood, huge trees, in stands covering large areas, with underbrush beneath that is of a different nature from that in the more open poplar woods. The sun scarcely penetrates into the depths of the cottonwood groves and the gloom of their shade is suggestive of the dark woods on the coast. Rank grass, tall nettles, thimble-berry thickets, and devil's-club combine to form a tangle that can be penetrated at but few places.

There is an abundance of berry-bearing shrubs throughout the valley. Twin-berry (*Lonicera involucratum*), dogwood (*Cornus pubescens*), kinnikinnick (*Arctostaphylos uva-ursi*), and high bush cranberry (*Viburnum pauciflorum*) are among the most conspicuous. Thickets of hazel (*Corylus rostrata*) form a large percentage of the underbrush.

Nine-Mile Mountain

This mountain lies a short distance northeast of Hazelton; its southern base is skirted by the Babine trail, leading from the town. Our camp near the summit was about twenty miles, by road and by trail, northeast of Hazelton. In ascending the mountain, the poplar belt is left behind almost at the very base, and a forest of spruce, intermingled with cedar, is entered. At an altitude of about 2000 feet the lower edge of hemlock (*Tsuga heterophylla*) is reached; at about 2500 feet the forest is practically all hemlock, large trees, with little or no underbrush beneath. Just below timber line (about 4500 feet altitude) the forest is largely composed of white fir (*Abies grandis*), though some hemlock persists to the upper limit of tree growth.

We camped at timber line in a cabin precariously clinging to a little niche on the steep hillside. The slope was part of a huge amphitheater, the outstanding ridges on either side perhaps a mile apart, and the crest of the mountain about five hundred feet above. Immediately below was the dark hemlock and fir forest, its upper edge as sharply defined as though the open slopes above had been cleared by man. Much of this amphitheater was covered with tall grass, veratrum, and lupine; in places there were extensive thickets of alder. Wide rock slides extended down from the divide in several places, sometimes into the forests below. The trail to the top passed through a notch in the ridge at an altitude of about 5000 feet; rounded summits arose on either side about 500 feet higher. The summit of the mountain is composed of two converging ridges, each five or six miles long at least; we did not cover their entire area. Between these ridges is enclosed a broad, steeply sloping valley.

The country above timber line, covering many miles along the higher ridges, is open and park-like, very attractive to the view. White fir and mountain hemlock (*Tsuga mertensiana*) occur, dwarfed and prostrate, forming scattered thickets over ground that otherwise is mostly grass covered. Snow banks persist through the summer, and below the melting snow are occasional little lakes, sometimes an acre or more in extent. On damp slopes grass is replaced by false heather (*Cassiope mertensiana*), luxuriant growths that cover extensive areas. Below the ridges the grass became much higher and was intermingled with lupine.

An interesting feature of the Nine-mile Mountain avifauna is the unusual number of genera and species of grouse that occur there. At

the base of the mountain is the ruffed grouse (*Bonasa*) extending from the poplars below well up into the spruce and cedar woods. In the hemlock belt, upward to the tree limit, the Franklin grouse (*Canachites*) occurs. Just below timber line, and even in thickets above, is the Fleming grouse (*Dendragapus*). On the Alpine-Arctic ridges three species of ptarmigan (*Lagopus*) are found. For six species of grouse to occur so nearly in the same place is, I believe, very unusual.

Zonal and Faunal Position of the Upper Skeena Valley

The upper Skeena Valley lies to the eastward of the coast ranges, and its fauna and flora, as a whole, are of the interior, not of the coast. Conditions in many respects are similar to those of the upper Stikine Valley (see Swarth, 1922, p. 141), two hundred miles to the northward, and observations in the Skeena Valley tend to corroborate conclusions reached in studies of the more northern region (Swarth, *loc. cit.*). The Skeena Valley is much more humid than the upper Stikine, and neither in animal nor plant life is it so sharply contrasted with the coastal region. The more southern coast ranges are not so high and precipitous as the northern mountains, and the gap through which the Skeena reaches the coast is broad, with sloping walls. Coastal rains often drift inland up the Skeena Valley, and cloudy skies are frequent. Certain coastal species of birds extend inland here much farther than they do along the Stikine.

The upper Skeena Valley, like the Stikine, is in the Canadian life zone, contrasted with the Hudsonian zone of the seacoast (see Swarth, 1922, p. 149). Study of the list of birds breeding in the lowlands of the Hazelton region discloses many that are not found on the coast; mostly these are species that elsewhere occur in zones lower than Hudsonian. Some conspicuous ones are:

Bonasa u. umbelloides
Phloeotomus p. picinus
Nuttallornis borealis
Empidonax t. alnorum
Empidonax hammondi
Piranga ludoviciana

Certain species were seen about Hazelton that are usually found in lower zones even than the Canadian. These are:

Tyrannus tyrannus
Stelgidopteryx serripennis
Vireosylva olivacea
Dumetella carolinensis
Troglodytes a. parkmani

There are, it is true, a number of birds found at sea level on the coast and in the lowlands of the Hazelton region, represented either by the same species or subspecies in both places, or by closely related subspecies, but these are mostly wide-ranging forms, not closely confined within any particular zone. Some such species are:

Ceryle a. caurina
Spinus p. pinus
Melospiza m. morphna
Melospiza l. lincolni
Hirundo erythrogaster
Planesticus m. migratorius

There are eighteen such cases.

Turning now to conditions at high altitudes, we find the following birds in summer at timber line (Hudsonian Zone) on Nine-mile Mountain:

Dendragapus o. flemingi
Canachites franklini
Perisoreus c. canadensis
Loxia leucoptera
Zonotrichia coronata
Passerella i. annectens
Dendroica townsendi
Wilsonia p. pileolata
Nannus h. pacificus
Certhia f. occidentalis
Sitta canadensis
Penthestes g. abbreviatus
Penthestes h. columbianus
Regulus s. olivaceus
Regulus c. calendula
Hylocichla g. guttata
Ixoreus n. naevius

Of these seventeen species, just four (*Perisoreus c. canadensis, Zonotrichia coronata, Penthestes g. abbreviatus,* and *Penthestes h. columbianus*) are not found upon the coast. The others, represented either by the same species or by closely related complementary subspecies, are mostly common and characteristic birds of the forests at sea level in the coastal region. In general, the avifauna at sea level on the coast is thus seen to be closely similar to that found just below timber line (4500 feet altitude), two hundred miles inland.

It is of interest to note that muskeg surroundings in the valleys of the upper Skeena region produced certain birds usually found in the Hudsonian Zone. Occasional pairs, at wide intervals, were thus noted of the following species:

Picoides arcticus
Picoides a. fasciatus
Sitta canadensis
Regulus s. olivaceus
Regulus c. calendula
Ixoreus n. naevius

On the treeless summit of Nine-mile Mountain the following birds were found breeding:

Lagopus l. alexandrae
Lagopus rupestris
Lagopus l. leucurus
Otocoris a. arcticola
Leucosticte t. littoralis
Passerculus s. alaudinus
Anthus rubescens

Lack of suitable open country elsewhere may be an element in the occurrence of a horned lark and a Savannah sparrow as Alpine-Arctic species in this region, but the other species listed are all representative inhabitants of the Alpine-Arctic Zone.

Results of this classification of the birds by their zonal predilections may be summarized as follows: that the valleys of the upper Skeena region, east of the coast ranges, are in the Canadian life zone; that on the surrounding mountains there is a well defined belt of Hudsonian Zone; and that the treeless mountain tops pertain to the Alpine-Arctic Zone. At this latitude the Canadian life zone does not reach the coast, where but two life zones can be defined, Hudsonian from sea level upward to the tree limit, and Alpine-Arctic above that.

An analysis of the occurrence of mammals in this general region, as far as our more limited knowledge of them extends, tends to corroborate the above statements based upon the avifauna.

The upper Skeena Valley is the northern limit reached in this region by the following species of birds:

Phloeotomus p. picinus	Bombycilla cedrorum
Tyrannus tyrannus	Vireosylva olivacea
Hesperiphona v. brooksi	Dendroica a. auduboni
Zonotrichia albicollis	Dendroica magnolia
Junco o. shufeldti	Dumetella carolinensis
Stelgidopteryx serripennis	Troglodytes a. parkmani

Some of these get no farther north than the town of Hazelton. Of the others, it is doubtful if favorable conditions occur for more than fifty or sixty miles north of that point, at the outside. There are enough of these southern species to give character to the avifauna of this region, they all are stopped at practically the same boundary, and some have closely related congeners in the country immediately to the northward (see Swarth, 1922, p. 152).

Besides the species of mammals collected, certain others came to our attention. Tracks of black bear (*Ursus americanus*) appeared along the rivers in September when the salmon were dying. Coyotes (*Canis*), though never seen, were frequently heard howling in Kispiox Valley. Beaver (*Castor canadensis*) were actively at work in certain small lakes near our Kispiox Valley camp. Fresh tracks of deer (*Odocoileus*) were noted at the summit of Nine-mile Mountain, and a single deer was seen in Kispiox Valley, September 8. A number of shed horns of caribou (*Rangifer*) were found on Nine-mile Mountain, but the animals themselves were not there at that time.

CHECK LIST OF THE BIRDS

1. Colymbus holboelli (Reinhardt).
2. Gavia immer (Brünnich).
3. Larus brachyrhynchus Richardson.
4. Mergus americanus Cassin.
5. Anas platyrhynchos Linnaeus.
6. Mareca americana (Gmelin).
7. Nettion carolinense (Gmelin).
8. Dafila acuta (Linnaeus).
9. Anser albifrons (Scopoli), subsp.?
10. Branta canadensis (Linnaeus), subsp.?
11. Botaurus lentiginosus (Montagu).
12. Ardea herodias Linnaeus, subsp.?
13. Gallinago delicata (Ord).
14. Pisobia bairdi (Coues).
15. Pisobia minutilla (Vieillot).
16. Ereunetes mauri Cabanis.
17. Tringa solitaria cinnamomea (Brewster).
18. Bartramia longicauda (Bechstein).
19. Actitis macularia (Linnaeus).
20. Dendragapus obscurus fiemingi Taverner.
21. Canachites franklini (Douglas).
22. Bonasa umbellus umbelloides (Douglas).
23. Lagopus lagopus alexandrae Grinnell.
24. Lagopus rupestris (Gmelin), subsp.?
25. Lagopus leucurus leucurus (Swainson).
26. Circus hudsonius (Linnaeus).
27. Accipiter velox (Wilson).
28. Astur atricapillus atricapillus (Wilson).
29. Astur atricapillus striatulus Ridgway
30. Buteo borealis calurus Cassin.
31. Buteo swainsoni Bonaparte.
32. Aquila chrysaetos (Linnaeus).
33. Haliæetus leucocephalus alascanus C. H. Townsend.
34. Falco columbarius columbarius Linnaeus.
35. Falco columbarius suckleyi Ridgway.
36. Falco sparverius sparverius Linnaeus.
37. Pandion haliaëtus carolinensis (Gmelin).
38. Bubo virginianus lagophonus (Oberholser).
39. Ceryle alcyon caurina Grinnell.
40. Dryobates villosus monticola Anthony.
41. Dryobates pubescens leucurus (Hartlaub).
42. Picoides arcticus (Swainson).
43. Picoides americanus fasciatus Baird.
44. Sphyrapicus varius ruber (Gmelin).
45. Phloeotomus pileatus picinus Bangs.
46. Colaptes auratus borealis Ridgway.
47. Chordeiles virginianus virginianus (Gmelin).
48. Cypseloides niger borealis (Kennerly).
49. Chaetura vauxi (J. K. Townsend).

50. Selasphorus rufus (Gmelin).
51. Tyrannus tyrannus (Linnaeus).
52. Sayornis sayus yukonensis Bishop.
53. Nuttallornis borealis (Swainson).
54. Myiochanes richardsoni richardsoni (Swainson).
55. Empidonax trailli alnorum Brewster.
56. Empidonax hammondi (Xantus).
57. Empidonax wrighti Baird.
58. Otocoris alpestris arcticola Oberholser.
59. Cyanocitta stelleri annectens (Baird).
60. Perisoreus canadensis canadensis (Linnaeus).
61. Corvus brachyrhynchos hesperis Ridgway.
62. Agelaius phoeniceus arctolegus Oberholser.
63. Euphagus carolinus (Müller).
64. Hesperiphona vespertina brooksi Grinnell.
65. Carpodacus purpureus purpureus (Gmelin).
66. Loxia leucoptera Gmelin.
67. Leucosticte tephrocotis littoralis Baird.
68. Spinus pinus pinus (Wilson).
69. Calcarius lapponicus alascensis Ridgway.
70. Calcarius pictus (Swainson).
71. Calcarius ornatus (J. K. Townsend).
72. Passerculus sandwichensis alaudinus Bonaparte.
73. Zonotrichia leucophrys gambeli (Nuttall).
74. Zonotrichia coronata (Pallas).
75. Zonotrichia albicollis (Gmelin).
76. Spizella monticola ochracea Brewster.
77. Spizella passerina passerina (Bechstein).
78. Junco hyemalis hyemalis (Linnaeus).
79. Junco hyemalis connectens Coues.
80. Junco oreganus shufeldti Coale.
81. Melospiza melodia morphna Oberholser.
82. Melospiza lincolni lincolni (Audubon).
83. Passerella iliaca iliaca (Merrem).
84. Passerella iliaca altivagans Riley.
85. Piranga ludoviciana (Wilson).
86. Hirundo erythrogaster Boddaert.
87. Iridoprocne bicolor (Vieillot).
88. Tachycineta thalassina lepida Mearns.
89. Stelgidopteryx serripennis (Audubon).
90. Bombycilla garrula pallidiceps Reichenow.
91. Bombycilla cedrorum Vieillot.
92. Vireosylva olivacea (Linnaeus).
93. Vireosylva gilva swainsoni (Baird).
94. Vermivora celata celata (Say).
95. Vermivora celata lutescens (Ridgway).
96. Vermivora peregrina (Wilson).
97. Dendroica aestiva rubiginosa (Pallas).
98. Dendroica coronata hooveri McGregor.
99. Dendroica auduboni auduboni (J. K. Townsend).
100. Dendroica magnolia (Wilson).
101. Dendroica striata (J. R. Forster).

102. Dendroica townsendi (J. K. Townsend).
103. Seiurus noveboracensis notabilis Ridgway.
104. Oporornis tolmiei (J. K. Townsend).
105. Geothlypis trichas occidentalis Brewster.
106. Wilsonia pusilla pileolata (Pallas).
107. Setophaga ruticilla (Linnaeus).
108. Anthus rubescens (Tunstall).
109. Dumetella carolinensis (Linnaeus).
110. Troglodytes aëdon parkmani Audubon
111. Nannus hiemalis pacificus (Baird).
112. Certhia familiaris occidentalis Ridgway.
113. Sitta canadensis Linnaeus.
114. Penthestes atricapillus septentrionalis (Harris).
115. Penthestes gambeli abbreviatus Grinnell.
116. Penthestes hudsonicus columbianus (Rhoads).
117. Penthestes rufescens rufescens (J. K. Townsend).
118. Regulus satrapa olivaceus Baird
119. Regulus calendula calendula (Linnaeus).
120. Myadestes townsendi (Audubon).
121. Hylocichla ustulata swainsoni (Tschudi).
122. Hylocichla guttata guttata (Pallas).
123. Hylocichla guttata pallasi (Cabanis).
124. Planesticus migratorius migratorius (Linnaeus).
125. Ixoreus naevius naevius (Gmelin).
126. Ixoreus naevius meruloides (Swainson).
127. Sialia currucoides (Bechstein).

GENERAL ACCOUNTS OF THE BIRDS

Colymbus holboelli (Reinhardt). Holboell Grebe

An adult male (no. 41986), taken in the Bulkley River at Hazelton, September 18, was the only one seen during the summer.

Gavia immer (Brünnich). Common Loon

There seemed to be a pair of loons to each of the many little lakes scattered through the woods. The birds were frequently seen circling about overhead, calling as they flew. Toward the end of summer several might be in sight at once, going through such maneuvers.

Larus brachyrhynchus Richardson. Short-billed Gull

An immature male (no. 41987) was shot July 31 near the summit of Nine-mile Mountain, at about 5500 feet altitude. There were several small, snow-bordered lakes nearby, but otherwise nothing in the surroundings that might be thought attractive to gulls.

In late August and September, when the salmon run was drawing to a close, many gulls were seen along the rivers. None was collected, but the birds observed were mostly of some species larger than *brachyrhynchus*.

Mergus americanus Cassin. American Merganser

Breeding in Kispiox Valley; adults occasionally flushed from streams and sloughs, and several broods of young encountered. On June 28 a female with eleven ducklings appeared in the swift-flowing creek by our camp, the young still mostly down-covered.

Anas platyrhynchos Linnaeus. Mallard

Breeding in Kispiox Valley. A nest with eggs was reported by an acquaintance, found about the middle of June in a hayfield. We saw single birds at various times during June and July. Toward the end of August there was an influx of migrating ducks, a large proportion of them mallards, and flocks of forty, fifty, or a hundred were seen daily on gravel bars in the Kispiox River. Here the ducks were feeding on salmon roe. Mallard and green-winged teal were the only species present in numbers, and individuals of each of these shot from time to time invariably contained salmon eggs in their gullets. The humpback salmon (*Oncorhynchus gorbuscha*), the species 'running' at that time, was present in myriads, and the ducks formed but a fraction of the animals that were preying upon fish or eggs.

Two adult males partly in the eclipse plumage were shot on September 10, and one (no. 41988) was preserved. In this bird the chestnut breast and gray underparts of the winter plumage are mostly acquired, while of the eclipse plumage there remain the brown-streaked head and neck, many brown feathers on back and flanks, and the tail feathers. An adult male (no. 42638) taken at Okanagan Landing, British Columbia, on October 1, is not nearly so far advanced in the molt, having but a few scattered new feathers over various parts of the head and body.

Mareca americana (Gmelin). Baldpate

One was shot on the Bulkley River at Hazelton, September 17.

Nettion carolinense (Gmelin). Green-winged Teal

Common in Kispiox Valley in September. First seen August 26, a single bird. On August 30 a pair was noted, and a few days later flocks of from forty to fifty birds were frequently encountered. At the end of our stay, September 17, they were still abundant. Two specimens preserved, a female (no. 41989) and a young male (no. 41990).

Dafila acuta (Linnaeus). Pintail

A flock of four seen near the Kispiox River, September 1, and others noted from time to time during the ensuing two weeks. Not abundant.

Anser albifrons (Scopoli), subsp.? White-fronted Goose

A flock of seven white-fronted geese passed overhead, going south, near Hazelton, September 19.

Branta canadensis (Linnaeus), subsp.? Canada Goose

A flock of eight geese was seen in Kispiox Valley, the evening of June 24, flying low and apparently headed for a lake in the woods a few miles from our camp. Their occurrence in a flock at that season seems rather extraordinary. They were geese of the *canadensis* group, and apparently of large size. The subspecific status, of course, could not be ascertained.

Botaurus lentiginosus (Montagu). Bittern

A bittern was flushed from a marsh in Kispiox Valley on August 22, at close enough range to make identification certain, though the bird was not shot. On September 3, late in the evening, a heron of some sort, apparently a bittern, flew over our camp. This, I believe, is as far to the northwest as the species has been seen.

Ardea herodias Linnaeus, subsp.? Great Blue Heron

One seen near Hazelton, June 10, and two in Kispiox Valley on June 20. We were told that herons sometimes occurred in fair abundance along the Kispiox River. Probably it is *Ardea herodias fannini* that occurs in this region.

Gallinago delicata (Ord). Wilson Snipe

A fairly common fall migrant in Kispiox Valley. First seen August 20, and subsequently on many occasions up to the time of our departure, September 17. Two specimens preserved (nos. 41991, 41992).

Pisobia bairdi (Coues). Baird Sandpiper

A flock of eight seen on the summit of Nine-mile Mountain, August 5, and again (apparently the same flock) on August 10. One shot but not preserved. A flock of six was about a mud puddle in the town of Hazelton, August 15.

Pisobia minutilla (Vieillot). Least Sandpiper

Two shot, one (no. 41993) preserved, on the Kispiox River, August 27. An occasional small flock of sandpipers was seen there, but not many.

Ereunetes mauri Cabanis. Western Sandpiper

One bird (no. 41994) shot from a small flock on the Kispiox River, August 27.

Tringa solitaria cinnamomea (Brewster). Western Solitary Sandpiper

One bird shot, but not preserved, in Kispiox Valley, August 18; the only one seen all summer.

Bartramia longicauda (Bechstein). Upland Plover

Appeared in small numbers, migrating, in Kispiox Valley the latter part of August. First seen August 17 (we were told they had appeared some days earlier) and at intervals, two or three birds at a time, until August 26. They frequented open fields where hay was raised, relatively limited areas that had been cleared in recent years. The country in general is densely forested; with settlement, more and more of such clearings have been made, and the species may be extending its range with the opening of favorable areas. This station is, I believe, an extreme western point of record for the upland plover in northern British Columbia. Four specimens were preserved (nos. 41996–41997), apparently all immature birds in first winter plumage.

Actitis macularia (Linnaeus). Spotted Sandpiper

A few individuals seen at intervals through the summer, on the shores of the Skeena and Bulkley rivers near Hazelton, and on the Kispiox River. One specimen (no. 41995) preserved, an immature male taken on the Kispiox River, August 18.

Dendragapus obscurus flemingi Taverner. Fleming Grouse

Found in small numbers on the upper slopes of Nine-mile Mountain, mostly just below the upper limit of upright timber, at from 4500 to 5000 feet altitude. During the three weeks we spent at that place we saw one adult male and eight or ten females. Small young were encountered several times, never more than three or four to a brood, and sometimes only one. Several females seen were alone, and apparently without broods. Three females collected (nos. 42000–42002). Two, taken August 5 and 8, respectively, are just beginning the annual molt. These birds are indistinguishable from specimens taken on the Stikine River, two hundred miles to the northwest (see Swarth, 1922, p. 203).

Canachites franklini (Douglas). Franklin Grouse

Seen in woods of spruce, fir, and hemlock, near the summit of Nine-mile Mountain (4000 to 4500 feet altitude), and along the telegraph line at a point some forty miles north of Hazelton. Eleven specimens collected (nos. 42003–42013): an adult male, two adult females, and three chicks from Nine-mile Mountain; an adult female, two immature males, and two females probably immature, from the second record station. These specimens bear out Riley's (1912, p. 55) comments upon the earlier molt of the adult male, as compared with female and young. The adult male collected August 2 has nearly completed the annual molt. Adult females taken August 10 and 11 are still in the old plumage. The three chicks, taken with the female parent on August 10, an entire family, are about one-quarter grown, in juvenal plumage save for remnants of natal down on the throats of two. Two young males and two apparently young females taken September 12 have nearly completed the molt into first winter plumage; an adult female taken September 12 is nearly through the annual molt.

The one adult male has a nearly uniformly black tail. There is a slight whitish tip to the central feathers, and a faintly indicated light-

colored bar across the center of the tail, not to be seen unless the feathers are widely spread. Of the two immature males, one has the tail black except for scattered and faint reddish spots near the tips of some feathers; the other has the central rectrices narrowly tipped with whitish, some of the others very faintly with pale reddish. Of the five females, all have the central rectrices with more or less of a pale margin at the tip, and only one lacks such tipping to the lateral rectrices.

The adult male has large and conspicuous whitish spots on the long upper tail coverts. On the two immature males these spots are poorly indicated. On the two summer females they are inconspicuous; two of the three fall females have them conspicuously present, in one they are slight. In this series of birds there is no evidence of two color phases (as described by Riley, *loc. cit.*).

Bonasa umbellus umbelloides (Douglas). Gray Ruffed Grouse

Abundant throughout the poplar woods of the lowlands. On June 18 several broods of small young were seen, and from then on flocks of growing youngsters were frequently encountered. Toward the end of August some flocks were of such size as to make it seem probable that they were composed of two or more broods. The cocks are solitary through the summer; even in September extremely wary single birds were flushed that were assumed to be old males that had not yet joined the flocks.

Fourteen specimens collected (nos. 42014–42027), one old male, June 5, the others all taken in September and in the latter stages of the autumnal molt. The molt is completed about October 1. Two are red tailed, twelve gray tailed, indicating a preponderance of the gray phase in this region.

Two fall specimens at band from St. John trail, upper Peace River, Alberta, may be assumed to be representative of typical *umbelloides*. The birds from Hazelton and Kispiox Valley, though referable to *umbelloides*, are appreciably less grayish, more brownish in coloration, than these Peace River specimens, and they are also less gray than ruffed grouse from the upper Stikine River, to the northward. The increased brownness of the Skeena Valley grouse may be indicative of intergradation toward *sabini* of the southern coastal region of British Columbia. How far north *sabini* extends is as yet undetermined.

Lagopus lagopus alexandrae Grinnell. Alexander Willow Ptarmigan

Ptarmigan are said to occur occasionally in the lowlands of the Hazelton region in midwinter, but during most of the year they are restricted to the Alpine-Arctic mountain tops. We found them in limited numbers on the timberless summit of Nine-mile Mountain. There are miles of open country on the two converging ridges that form the top of this mountain, barren of trees save for occasional thickets of dwarfed or prostrate Alpine conifers, and here, at long intervals, we encountered ptarmigan. It is a curious fact, whether or no it was a mere coincidence, that on one of the two ridges only white-tailed ptarmigan were found, on the other, willow and rock ptarmigan were seen, but no white-tailed. To all seeming the two ridges were of exactly the same character. In all, ten broods of willow and rock ptarmigan were encountered (the species were not always to be differentiated) and about five or six single birds in addition. The broods ranged from three to twelve in number; the aggregate of young birds seen was about fifty. The chicks grew rapidly. Some seen on July 25, and a day or two later, were down-covered and unable to fly. At that time they were accompanied by the female parent only, and the male birds were flushed separately. By August 10 the young ptarmigan were the size of quail and larger, and were strong on the wing. The old males were then associated with the families. In some of the larger broods seen the difference in size among the young was so marked as to suggest the junction of two families. It might happen that upon the death of a hen her offspring would seek the companionship of another family.

Five willow ptarmigan were collected (nos. 42028–42032), four adult males and one adult female. Three males have much white on the lower breast and abdomen, the fourth is almost solidly in the brown summer plumage. Many willow ptarmigan from different localities in the northwest have been available for comparison with these birds. Of *Lagopus lagopus lagopus* there is in this Museum from northern Alaska and Yukon (Kowak and Yukon rivers) a series of ninety-four skins, including a number in summer plumage or in process of change. Of *L. l. alexandrae,* there are eleven specimens from island localities in southeastern Alaska, including five summer males, and one male and two females in first fall plumage. A pair of breeding adults from Porcher Island, British Columbia, was loaned by Allan Brooks. There have been available, from the collection of the

Provincial Museum, Victoria, British Columbia, twenty-seven specimens from Lake Atlin, including nine summer males and eight summer females, and a male and female from Anaham Lake.

Island specimens of *alexandrae* (summer males), compared with *lagopus* from the Yukon and Kowak regions, are darker colored and with smaller and differently shaped bill. (The bill difference has been figured by Clark, 1910, p. 53.) Color is darkest in specimens from Prince of Wales Island. Atlin birds and Nine-mile Mountain birds are essentially alike, and are intermediate in color between *lagopus* of the interior and *alexandrae* from the islands; the average is nearer to *alexandrae*. The bill in size and shape is just as in *alexandrae*. Females from Atlin and Nine-mile Mountain differ from Kowak and Yukon birds in bill characters as do the males, and also in color. They are not of darker and richer browns, as might be expected, but present a duller, grayer appearance. In the northern *lagopus* the feathers above and below are broadly edged with bright hazel; in the southern birds these edgings are narrow and dull. On the basis of these comparisons I feel justified in extending the range of *alexandrae* eastward from the coast, at the north to Lake Atlin, at the south to Nine-mile Mountain and Anaham Lake. There is no question as to the difference of these southern mainland birds from *lagopus* of northern Alaska and the interior.

It is of interest to note in *alexandrae* the frequent presence of black shafts on the primaries, sometimes on secondaries and greater coverts. This character has been considered an important feature of the Newfoundland subspecies (*L. l. alleni*), as in the "key to the American subspecies of *Lagopus lagopus*" published by Clark (*loc. cit.*, p. 54), but obviously it cannot be used as a feature characteristic of that race alone. In an immature female from Prince of Wales Island (no. 31343, August 27), which has acquired the winter flight feathers, not only are primaries and secondaries with distinct black shafts, but there are large, tear-shaped spots of black near the tips of all the primaries and most of the secondaries. Furthermore, the primaries have a black 'freckling' over much of their surface, and the greater coverts are also marked with black though to a lesser degree.

Lagopus rupestris (Gmelin), subsp.? Rock Ptarmigan

Three specimens collected on Nine-mile Mountain, two young birds (nos. 42033–42034) partly in natal down, partly in juvenal plumage, taken August 1, and an adult female (no. 42035) collected August 5.

Fig. A. Tail of female rock ptarmigan (no. 42035), natural size. The outermost feather on each side is widely spread from the others to show pattern of coloration on inner web. Drawn by Allan Brooks.

There are not available enough summer specimens from other points to enable me to determine the subspecific status of these birds. There is at hand one summer-plumaged female from the Jade Mountains, north of the Kowak River, collected May 28, 1899 (no. 32170), presumably representative of *Lagopus rupestris rupestris*. Compared with the Nine-mile Mountain female, the Jade Mountains specimen is much brighter colored. There is a great deal of bright hazel in the plumage. The Nine-mile Mountain bird has a smaller bill (as compared also with many winter females from the Kowak River region), and is darker colored. Areas on individual feathers that in the

northern bird are rather brilliantly ruddy are of more restricted size and of a dull tone, and there is extension of black and grayish areas. It seems likely that these two birds represent two different subspecies.

There are no adult females of *Lagopus rupestris dixoni* available, and but two summer males (nos. 371, 372, Port Frederick, Chichagof Island, July 30, 1907). Two summer males from Atlin, British Columbia, loaned by the Provincial Museum, Victoria (no. 2566, June 26, 1914; no. 2589, July 1, 1914), are quite unlike *dixoni,* sufficiently so to make it seem improbable that *dixoni* is a southern race of general occurrence on the mainland as well as on the Alaskan islands.

The Nine-mile Mountain female possesses one feature worthy of comment. The six outer tail feathers on each side are white basally, the total white area covering more than half the tail. On the inner rectrices the white extends over about the basal three-fourths; it decreases on the inner web of the outer feathers, though extending far toward the tip on the outer web (see fig. A). This is exactly the character ascribed to *Lagopus hyperboreas* Sundevall, of Spitzbergen (see Dresser, 1871, p. 179, col. pl. no. 482, text fig.; Ogilvie-Grant, 1893, p. 51). The white tail was not peculiar to the one specimen collected, for other females were seen on Nine-mile Mountain which had the same marking. It was conspicuous in flight. No male was noted with this character; in fact no male *rupestris* was positively recognized.

The two chicks collected are readily distinguished from young *leucurus* by their generally browner color. Young *leucurus* is distinctly gray. The young of *lagopus* is more ruddy throughout.

Lagopus leucurus leucurus (Swainson). White-tailed Ptarmigan

Found only on the eastern ridge of Nine-mile Mountain. Four specimens collected, two adult females and two chicks (nos. 42036–42039). The young birds, taken on July 26 and August 1, respectively, have some natal down about the head; otherwise they are in juvenal plumage. Three broods of white-tailed ptarmigan were seen, one of two chicks, one of three, and one of twelve.

Circus hudsonius (Linnaeus). Marsh Hawk

An adult male was seen repeatedly during parts of June and July about the same locality in Kispiox Valley. At the end of the summer the first migrant was seen September 10, and a few others were noted at later dates.

Accipiter velox (Wilson). Sharp-shinned Hawk

Several seen near Hazelton, migrating, May 27. As single birds were encountered at intervals during the summer in Kispiox Valley and on Nine-mile Mountain, it seems likely that a few pairs breed in the region. The last week in August, with the beginning of the migration, sharp-shinned hawks became fairly abundant. That is, one or two birds were seen daily, some days four or five might be encountered. Three specimens collected: an adult male, May 31 (no. 42040), an adult female, just beginning the annual molt, July 13 (no. 42042), and an immature male, August 19 (no. 42041).

Astur atricapillus atricapillus (Wilson). Eastern Goshawk

During the third week in August migrating goshawks appeared, and from then on, during September, they were abundant. Scarcely a day passed without at least one being seen, and frequently seven or eight would be noted within a few hours. The species is usually solitary but it was not uncommon here to find two together. Mostly they were young birds, and as a rule absurdly unsuspicious. Two of the three goshawks collected during August (nos. 42045, 42046), all in immature plumage, are evidently of the subspecies *atricapillus*, and I believe that nearly all seen at that time were the same. They appeared to constitute a migratory 'wave' from some more northern region.

Astur atricapillus striatulus Ridgway. Western Goshawk

A female goshawk (no. 42043) of this subspecies collected at Hazelton, on May 30 is, save for a few scattered feathers on the tibiae, in immature plumage throughout. A male bird (no. 42044) taken July 16 is in the midst of the molt from the immature to adult plumage. An immature male (no. 42046) was collected in Kispiox Valley, August 29. The last mentioned appeared at the same time as other migrating hawks. The other two, taken in May and July, respectively, may indicate the breeding of this subspecies in the region. They could not be positively recognized as breeding individuals, however. Remains of flicker and ruffed grouse were found in the stomach of no. 42044; ruffed grouse in that of no. 42046.

Buteo borealis calurus Cassin. Western Red-tailed Hawk

Several pairs were breeding near Hazelton and in Kispiox Valley. In the latter locality, not far from our camp, there was an occupied nest at the top of a tall tree that towered above a surrounding jungle, too impenetrable to be traversed.

Toward the end of August there was a noticeable increase in the number of red-tails observed, due probably to an influx of migrants, and many were seen up to the end of my stay, September 26. There was wide variation in color; light-breasted birds were seen and some exceedingly dark ones. One specimen was collected (no. 42048), an immature male, taken in Kispiox Valley August 27. It is in the dark phase of plumage, blackish throughout with extensive white streaks and blotches partly concealed at the bases of the feathers.

Buteo swainsoni Bonaparte. Swainson Hawk

Hawks supposed to be of this species were seen occasionally late in August and early in September, but only one was shot. This bird (no. 42049) is an immature male, taken in Kispiox Valley, August 24. Its stomach contained a toad.

Aquila chrysaëtos (Linnaeus). Golden Eagle

Seen at intervals during the summer, at Hazelton, at the base of the nearby mountain range, Rocher Déboulé, and on Nine-mile Mountain. From July 16 to 20 one was seen daily at Hazelton, haunting the river banks and evidently feeding on dead salmon. On Nine-mile Mountain one followed a regular beat almost daily, recognizable as the same individual through a peculiarity of marking. This bird was hunting marmots assiduously and swung about the mountain side low over the ridges, apparently trusting his sudden appearance to enable him to surprise a marmot at a distance from shelter.

Haliaeëtus leucocephalus alascanus C. H. Townsend. Northern Bald Eagle

Seen in the lowlands at various times during the summer. As the season advanced, the dead and dying salmon on the river banks were a bountiful source of food to the eagles, and increasing numbers of the birds appeared. What seemed to be entire families were seen several times, in July, groups composed of two adults with two or three full-grown young.

Falco columbarius columbarius Linnaeus. Eastern Pigeon Hawk

Falco columbarius suckleyi Ridgway. Black Pigeon Hawk

The two subspecies of the pigeon hawk that are found in the region are rarely to be distinguished in life, so that birds seen can be recorded only under the specific name. Two pigeon hawks observed near Hazelton on May 26 were presumably migrants; none was noted during midsummer. The first fall migrant appeared August 22, and from then on to the end of my stay (September 26) some were seen nearly every day, sometimes several in one day.

The pigeon hawk is a remarkably swift flier, a fact borne out by the stomach contents of one of my birds, the remains of a black swift (*Cypseloides niger borealis*). That this hawk can capture a swift in fair chase in the open is not likely (see Meinertzhagen, 1921, p. 237), but after observation of both species I see no reason to doubt that on occasion the swift could be taken unawares and caught by the hawk after a short burst of great speed. This is in opposition to a possible explanation that in the case in question the hawk had captured a sick or disabled bird.

Six specimens collected: one adult male, three immature males, and two (presumably) immature females. This series is of interest in its bearing upon the relationship of *columbarius* and *suckleyi*. Not one of the lot is typical of *columbarius*, though I have so labeled five of them (nos. 42050–42053, 42055), as most closely resembling that subspecies. One female (no. 42054, Kispiox Valley, August 29) is a typical, even an extreme, example of *suckleyi*. The second female (no. 42053, Kispiox Valley, September 12) is nearer true *columbarius* than any others of this series. The three immature males (nos. 42050–42052), taken in Kispiox Valley on August 28, 22, and 23, respectively, are intermediate in appearance between *columbarius* and *suckleyi*, an intermediateness that is exhibited in a rather curious way. Ventrally they are in color and markings practically like *columbarius*, but dorsally they are quite as dark colored as the average immature *suckleyi*. This same sort of intermediateness, that is, light ventral and dark dorsal coloration, is also shown in an immature female (no. 39762) from the lower Stikine River, British Columbia, collected August 14, 1919 (see Swarth, 1922, p. 214), and intermediateness both above and below is shown in an immature female (no. 40371) taken near Coulterville, California, on December 20, 1919.

The adult male collected (no. 42055, Hazelton, September 24) is referred to *columbarius*, though darker colored than any other adult of that subspecies that I have seen. There are nine adult male pigeon hawks in the several collections housed in the Museum of Vertebrate Zoology, and these exhibit an interesting range of variation. An extreme of darkness is represented by the Hazelton bird above referred to, but slightly removed from that of *suckleyi*. At the opposite extreme, of light coloration, is an example of *richardsoni*. Between, there are seven specimens, labeled *columbarius*, illustrating unbroken gradation from one extreme to the other. Thus, in adult birds as in immatures, there is no one character of color or markings that may be taken as absolutely indicative of any one form. The three names, *columbarius*, *suckleyi*, and *richardsoni*, apply to three subspecies of one species, between which no definite lines may be drawn.

There is this to be said, however, that the above comments are based, not upon breeding birds, but upon specimens collected during the migrations and in winter. The line of nicely graded adults just described was not arranged with regard to geographic continuity. Breeding pigeon hawks are scarce in collections (not one was available to the present writer) and, for the most part, deductions must be drawn as best they may from non-breeding birds.

The Hazelton series is of interest in that it includes a specimen of *suckleyi* from what I believe is the northernmost point at which this subspecies has been definitely recorded. This place is at an intermediate point between humid coast and arid interior, and most of the pigeon hawks taken there are intermediate in appearance. Of course these birds were not found actually breeding, but the conclusion does not seem forced that they are representative of the form that does breed in that general region.

In this discussion I have ignored the recently described *Falco columbarius bendirei* of Swann (1922, p. 66; type locality, Fort Walla Walla, Washington). It may be possible eventually to demonstrate the existence of this additional western subspecies, but the two eastern specimens available to me are not to be distinguished from western birds here regarded as *columbarius*.

Falco sparverius sparverius Linnaeus. American Sparrow Hawk

A fairly common summer visitant to the lowlands. A few were seen in the open country above timber on Nine-mile Mountain, but that was early in August and the birds noted had probably wandered

from nesting grounds at lower altitudes. Abundant in Kispiox Valley and about Hazelton during the latter part of August, and in lessening numbers in September. Some were seen up to the time of my departure, September 26.

Fifteen specimens collected (nos. 42056–42070). Full-grown young were taken July 18. An adult female taken August 20 has finished the annual molt; an adult male taken on the same date, and another shot September 7, are still in the midst of the change.

Pandion haliaëtus carolinensis (Gmelin). Osprey

We found no ospreys breeding in the region covered, but about the middle of August, with the coming of the salmon, the fish hawks began to appear. During the latter part of August and throughout September, some were seen almost daily.

Bubo virginianus lagophonus (Oberholser). Ruddy Horned Owl

Exceedingly abundant throughout the lowlands. At our timberline camp on Nine-mile Mountain we neither saw nor heard horned owls, but they were present everywhere in the valleys, and in unusual numbers for a large, predatory bird. The abundance of rabbits in the region may have caused a temporary increase in the number of horned owls.

Twenty-one specimens were collected (nos. 42071–42091). Of these, six are young, mostly down-covered (two in one brood, June 5; four in one brood, June 24); the rest are young and old in fresh fall plumage. Food was found in eight stomachs. In one case a young owl had been fed a red squirrel, the others contained rabbit and nothing else. This is noteworthy in view of the general belief that the horned owl is an inveterate enemy of grouse. These owls inhabited the poplar woods, precisely the same environment as the ruffed grouse, and ruffed grouse were abundant.

Considerable color variation is shown in this series of owls, gray colored birds at one extreme, brown colored at the other. The grayest bird (no. 42091) was the last one shot, on September 9, and might be assumed to be a migrant of a race other than the breeding form, but there are earlier taken specimens in the series that are nearly as light colored. I think it safe to say that the differences illustrate the extent of individual variation existent in the subspecies *lagophonus* in this one region. (For use of the name *lagophonus*, see Oberholser, 1904, p. 185; Ridgway, 1914, p. 747.)

Ceryle alcyon caurina Grinnell. Western Belted Kingfisher

By streams and lakes everywhere in the lowlands. Present in the region when we arrived, May 25, and up to the time of our departure, September 26. One specimen collected (no. 42092).

Dryobates villosus monticola Anthony.
Rocky Mountain Hairy Woodpecker

Fairly common in the lowlands, mostly in deciduous timber. Present during the whole of our stay; probably resident the year through. Young were seen flying about on June 22; birds taken September 1 had finished the molt. Twelve specimens collected (nos. 42093–42104), seven breeding adults, two in juvenal plumage, and three in fresh fall plumage.

Dryobates pubescens leucurus (Hartlaub). Batchelder Woodpecker

In small numbers in deciduous woods in the lowlands. Young out of the nest were taken June 29. Two specimens collected September 5 and 8, respectively, had finished the molt. Thirteen specimens in all were collected (nos. 42104–42117).

A specimen of downy woodpecker from Fort Babine, in this same general region, has been ascribed by Ridgway (1914, p. 239) to the subspecies *Dryobates pubescens glacialis* Grinnell (type locality, Prince William Sound, Alaska). This induced comparison of the Skeena Valley series with the four Alaskan specimens of *glacialis* at hand, and the two lots were found to be indistinguishable. In the original description of *glacialis* (Grinnell, 1910, p. 390), comparisons are made with *nelsoni,* of the interior of Alaska, and *gairdneri,* of the coast of British Columbia. The American Ornithologists' Union Committee (1912, p. 386) refused recognition to the race *glacialis* on the grounds that it was an "intergrade between *D. p. nelsoni* and *gairdneri.*" Ridgway (1914, p. 239) accords recognition to *glacialis,* but, in describing the race, compares it again with the Alaskan *nelsoni,* and also with the eastern *medianus.*

So far, no comparisons had been made between *glacialis* and the downy woodpecker of the more southern Rocky Mountains, *D. p. homorus* of recent literature. The Skeena Valley series, however, was taken sufficiently near the known range of that subspecies to suggest the desirability of such comparisons. Pertinent material is at hand

as follows: Prince William Sound, Alaska, 2 specimens (including the type of *Dryobates pubescens glacialis*); lower Taku River, Alaska, 2; Skeena River region (Hazelton and Kispiox Valley), British Columbia, 13; Warner Mountains, California, 4; Sierra Ancha, Arizona, 2. In my opinion, the downy woodpeckers from these several points should all be included under one name. As shown in the accompanying table, the southern birds are slightly larger than the northern ones, which is curious, considering north and south variation in general in the genus *Dryobates*. The southern birds are also somewhat blacker, that is, with less white spotting upon wings and coverts. Individual variation is such, however, that it is impossible satisfactorily to diagnose two subspecies in the material examined.

For the application of the name *Dryobates pubescens leucurus* (Hartlaub) to the downy woodpecker of the Rocky Mountain region, see Grinnell, 1923, p. 30.

TABLE 1

MEASUREMENTS IN MILLIMETERS OF *Dryobates pubescens leucurus*

Mus. No.	Sex	Locality	Date	Wing	Tail	Culmen
1287	♂	Prince William Sound, Alaska,	Sept. 7, 1908	93	57	15.5
9732	♂im.	Taku River, Alaska,	Sept. 4, 1909	92.5	56.5	15.8
9733	♂	Taku River, Alaska,	Sept. 13, 1909	97.5	58	15.2
42117	♂	Kispiox Valley, B C.,	July 13, 1921	96.5	59	16.5
42115	♂	Kispiox Valley, B. C.,	Sept. 5, 1921	97	61	15
14137	♂	Warner Mts., Calif.,	June 29, 1910	98	58†	18.5
14138	♂	Warner Mts., Calif.,	June 30, 1910	101	65	18
27710	♂	Sierra Ancha, Arizona,	June 23, 1917	99.5	65.5	18
1288*	♀	Prince William Sound, Alaska,	Sept. 18, 1908	97.5	61	15
42105	♀	Hazelton, B. C.,	June 16, 1921	94	60	16
42108	♀	Kispiox Valley, B. C.,	June 29, 1921	95.5	62.5	16
42111	♀im.	Kispiox Valley, B. C.,	July 9, 1921	95.5	61.5	16.5
42116	♀	Kispiox Valley, B. C.,	Sept. 8, 1921	97.5	.....	15.5
14139	♀	Warner Mts., Calif.,	June 30, 1910	97.5	63.5	17.5
14140	♀	Warner Mts., Calif.,	July 6, 1910	100	62	17
27711	♀	Sierra Ancha, Ariz.,	June 25, 1917	100	67	17

* Type of *Dryobates pubescens glacialis* Grinnell.

† Rectrices shortened by wear.

Picoides arcticus (Swainson). Arctic Three-toed Woodpecker

Not common. We had been in the region three weeks before seeing a three-toed woodpecker of either kind. *Picoides arcticus* and *P. a. fasciatus* were then both discovered, each in small numbers, and under precisely the same conditions. They were in the lowlands, but inhabit-

ing the little muskegs that are scattered through the woods, well defined areas for which certain bird species showed a marked preference. No three-toed woodpeckers were seen on Nine-mile Mountain, though both species occur as a rule in the Hudsonian zone.

A nest of the Arctic three-toed woodpecker was found in Kispiox Valley. It was placed in a dead and charred Engelmann spruce, in a strip of spruce woods bordering a muskeg otherwise surrounded by poplar forest. The nest hole was eighty feet from the ground. It was two and one-half inches in diameter and one foot deep, drilled through an outer sheath of sound, hard wood, and downward through soft, rotten 'punk.' On July 3 it held one young bird nearly ready to fly, and a second, not much smaller, which had been dead for some days.

Four specimens collected (nos. 42118–42121), the young female mentioned above, its female parent, and, at other times, two adult males.

Picoides americanus fasciatus Baird. Alaska Three-toed Woodpecker

Four specimens collected (nos. 42122–42125), one adult male and three adult females. They differ from Alaskan examples of *fasciatus* in the notable restriction of white dorsal markings. The white bars on the back are limited in extent and in only one specimen is there even a trace of the white coalescing longitudinally. All four, however, show white spots on rump and upper tail coverts, markings that are supposed to distinguish *fasciatus* from *americanus*.

Sphyrapicus varius ruber (Gmelin). Red-breasted Sapsucker

All through the valleys this species was far more abundant than I have ever found sapsuckers elsewhere. It is curious that there should be this abundance here; this must be near the outskirts of the range of the bird. *Ruber* is regarded primarily as a coastal species, yet nowhere on the coast is it found in such numbers. On the southeastern Alaskan coast, near the Skeena River, it is doubtful if an observer would in a whole summer see twenty birds—the number counted near Hazelton in one forenoon.

During May and June a number of nests were found, mostly through seeing the old birds carrying food to the young. One was drilled in a live poplar, the tree a straight column with no branching limbs save at the very top, the nest some seventy feet from the ground. Another was in a dead birch, sixty feet up. Many others were noted.

all in birch or poplar, mostly dead trees, and no nest was less than fifty feet above the ground. One male bird collected had the abdomen bare of feathers. It obviously had been incubating eggs.

The first young bird was seen flying about on July 7. Shortly after, the species became notably scarce and few of the birds were observed through July and August. This, perhaps, was from some change in habits rather than a shifting of population. The first week in September numbers appeared once more. Several factors contribute to bring the sapsuckers conspicuously in view. They are assiduous drummers, on dead trees or on telegraph poles; they have querulous and noisy call notes, uttered near the nest; they are active flycatchers, using a telegraph pole or an isolated tree in a clearing as a base from which to fly.

Fourteen specimens collected (nos. 42126–42139). These are exactly like coastal birds in coloration, but differ in average bill structure. Compared with specimens from the nearby coast of southeastern Alaska, the Hazelton birds have the bill noticeably short and heavy. There is some overlapping in the two lots, for some Alaskan specimens have bills as short as some Hazelton birds. None of the latter series, however, has the long, slender bill that is generally characteristic of the Alaskan birds. Adult sapsuckers from the upper Stikine River (see Swarth, 1922, p. 220) have the same type of bill as the Hazelton birds. (For use of the name *ruber* for the northern subspecies of the red-breasted sapsucker see Swarth, 1912, p. 34.)

Phloeotomus pileatus picinus Bangs. Western Pileated Woodpecker

In June and again in late September, single birds were seen or heard several times near the base of Rocher Déboulé, southeast from Hazelton. This must be about the extreme northern limit of the species in this region. None was seen in Kispiox Valley, a few miles to the northward. One specimen collected (no. 42140), a male taken September 22.

Colaptes auratus borealis Ridgway. Boreal Flicker

Breeds abundantly in the lowlands, mostly in deciduous timber. Present when we arrived, May 25, and until our departure, September 26. During the last two weeks in August flickers were extremely scarce; then, early in September, they suddenly appeared in numbers and remained abundant throughout the month.

Hazelton is near the western limit to which the yellow-shafted flicker might be expected to range; it cannot be far to the westward that the red-shafted flicker (*Colaptes cafer cafer*) occurs. It is of interest that, of the breeding specimens from Hazelton and Kispiox Valley, nearly all show traces of *cafer* blood. The four adult summer males collected all show more or less red in the normally black 'mustache.' In females the *cafer* characters are not so conspicuous, showing sometimes in a tinge of reddish in the quills, sometimes in certain details of body markings or color. In one case, wings and tail are nearly as red as in typical *cafer*. Some young males (nestlings) show red in the 'mustaches,' but not so conspicuously as do the adults.

The flickers that arrived so numerously in September were, I believe, migrants from the north, from a region far removed from any chance of admixture with *cafer*. Five collected at that time are all typically *auratus*-like in every detail. In all, twenty-eight yellow-shafted flickers were collected (nos. 42141–42168). The series includes twelve nestlings, eight in one lot (the entire brood), and four from another brood that consisted of six in all.

Chordeiles virginianus virginianus (Gmelin). Eastern Nighthawk

Arrived at Hazelton, June 3. Fairly common in the lowlands thereafter until about the middle of August, when the birds began to disappear. Last seen August 31. Two specimens collected (nos. 42169–42170), adult male and female.

Cypseloides niger borealis (Kennerly). Black Swift

Abundant throughout the summer. Usually seen flying high overhead, seldom within gunshot of the ground. One specimen collected (no. 42171), an adult female, at Kispiox Valley, August 20.

Chaetura vauxi (J. K. Townsend). Vaux Swift

A few birds (perhaps three pairs) seen occasionally at a certain spot in the woods near Hazelton. Small flocks or single individuals noted at long intervals in Kispiox Valley. Last seen September 3. One specimen collected (no. 42172), an adult male, July 20.

Selasphorus rufus (Gmelin). Rufous Hummingbird

Abundant about Hazelton when we arrived, May 25. Frequenting gardens in the town and generally distributed through the lowlands. On Nine-mile Mountain a few hummingbirds were seen, perhaps ten or twelve all told during our stay (July 21–August 14); apparently all were young birds, wanderers from the valleys below. By the time we descended from the mountain, there were very few rufous hummingbirds left in the lowlands. No more old males were seen, and the last female or young was noted on August 18. Two specimens were collected, an adult male at Hazelton, May 30 (no. 42173), and an immature male on Nine-mile Mountain, August 4 (no. 42174).

Tyrannus tyrannus (Linnaeus). Eastern Kingbird

Two seen during the summer, an adult male taken near our Kispiox Valley camp on June 22 (no. 42175), and an adult female at Hazelton, July 20 (no. 42176). The first mentioned appeared to be in breeding condition. The Hazelton bird was first seen flying, approaching from a distance with all the appearance of a migrant. These captures constitute, I believe, an extreme northwestern point of record for this species.

Sayornis sayus yukonensis Bishop. Northern Say Phoebe

Apparently not breeding in this general region; at least, none was seen until the end of the summer. First noted, a single bird, August 23, obviously a migrant. Another on August 24 and two on August 26 make up the total number recorded. These four specimens (nos. 42177–42180), two males and two females, are all in juvenal plumage. Besides these birds there are two other northern examples of this species in the collection of this Museum, an adult male from Forty-mile, Yukon Territory (no. 4594) and a juvenal female from Sergief Island, Alaska (no. 39815). The adult has been described by Grinnell (1909, p. 206) as showing the characters ascribed to the subspecies *Sayornis sayus yukonensis* Bishop (1900, p. 115). The Sergief Island specimen has been recorded (Swarth, 1922, p. 224) as *Sayornis sayus*, with comment upon its appearance; it is exactly like the Kispiox Valley specimens. Altogether, this series, one adult and five juvenals, bears out Bishop's (*loc. cit.*) contention of the existence of a recognizable northern form of *Sayornis sayus*. In the young birds from the north,

the darker color and the lack of rusty markings dorsally and on the wings, as compared with southern specimens, is constant and conspicuous. The northern adult differs in measurements and proportions from any southern skin.

Nuttallornis borealis (Swainson). Olive-sided Flycatcher

Not common, but occurring as scattered pairs throughout the lowlands. Present when we arrived, the last week in May. Last bird seen September 2. One specimen collected (no. 42181).

Myiochanes richardsoni richardsoni (Swainson).
Western Wood Pewee

Common in the lowlands, usually about clearings. On our first day in the field, May 27, wood pewees were fairly numerous. The last was seen September 4. Six specimens collected, all breeding adults (nos. 42182–42187).

Empidonax trailli alnorum Brewster. Alder Flycatcher

An inhabitant of willow thickets in lowland swamps. Not common, and so shy that the species could easily be overlooked were it not for the call note. First arrival noted June 5; last bird seen August 24. Five specimens collected (nos. 42188–42192), three adult males, and two males in first winter plumage.

Empidonax hammondi (Xantus). Hammond Flycatcher

Abundant in the poplar woods of the lowlands. Present in numbers when we arrived, the last week in May, and almost up to the time of our departure. Early in September there was a marked diminution in numbers, but a few Hammond flycatchers appeared at intervals up to September 21, when the last one seen was collected. Ten specimens taken (nos. 42193–42202).

A nest (no. 1852) taken near Hazelton, June 16, contained two fresh eggs, probably an incomplete set. It is constructed outwardly of 'cotton' from the fireweed, and some plant fiber, and moss; the lining is of feathers and cattle hair.

A second nest (no. 1853), taken in Kispiox Valley, July 7, contained three slightly incubated eggs, a complete set. It was in a willow thicket at the edge of a small stream, about twenty feet from the

ground, and wedged between several limbs forming an upright crotch. This nest outwardly is composed mostly of finely shredded strips of bark; the lining is of cattle hair, with a few feathers of grouse and other birds. In each set the eggs are white, unmarked.

Empidonax wrighti Baird. Wright Flycatcher

In the lowlands, in just such surroundings as are frequented by *Empidonax hammondi*. The two species are so nearly alike in life as to be indistinguishable to the eye, but different call notes serve for identification. On this basis it may be said that *E. wrighti* was rare, compared to the abundant *hammondi*. Three specimens, all adult, were collected (nos. 42203–42205); male, June 27; female, August 17; female, August 25. The two August birds are still mostly in worn breeding plumage.

One nest was found in Kispiox Valley. It was in a small, isolated clump of willows, in an upright crotch formed by several dead limbs, and about ten feet from the ground. On July 4 it contained two eggs, just hatching.

Otocoris alpestris arcticola Oberholser. Pallid Horned Lark

In small numbers on the Alpine-Arctic summit of Nine-mile Mountain. The last week in July young birds were seen flying about. Three adults collected (nos. 42206–42208), a male and a female on July 31, a male on August 1. The males are well advanced in the annual molt, the female has hardly begun.

On September 22 four horned larks were seen flying overhead near Hazelton. This, evidently the beginning of the fall migration, was the only lowland occurrence observed.

Cyanocitta stelleri annectens (Baird). Black-headed Jay

A few seen the last week in May and early in June, toward the base of Rocher Déboulé, southeast of Hazelton. They did not act like nesting birds, and three specimens collected were evidently not breeding. In Kispiox Valley one appeared August 27, and thereafter, during September, they drifted through from time to time, usually single birds. On September 11 and 12 many were seen along the trail following the telegraph line some forty miles north of Hazelton. The last week in September they were fairly numerous near Hazelton, where we had seen them before in May. No black-headed jays were found on Nine-mile Mountain, where they might have been expected to breed.

Sixteen specimens collected (nos. 42209–42224), twelve in fresh fall plumage. In this series there is considerable variation in the white spot over the eye, one of the diagnostic features of *annectens*. In nine specimens it is conspicuously present, in five it appears in slight degree, and in two it is absent. This series was collected at what must be practically the northern and western limits of the subspecies *annectens*, and variation such as that described is presumably indicative of intergradation toward the coastal subspecies, *stelleri*. In dorsal coloration this series is decidedly blackish, as compared with the brownish cast seen in comparable examples of *stelleri;* the blue areas are appreciably paler, more greenish. These differences are sufficiently marked to justify the allocation of the entire series to the subspecies *annectens* despite the variation shown in one particular. There is no adequate series of typical *annectens* available to show the extent of divergence from the ordinary body color in that race.

Perisoreus canadensis canadensis (Linnaeus). Canada Jay

Undoubtedly nests in the Hudsonian Zone on the mountains near Hazelton, descending into the lowlands in fall and winter. There were a few Canada jays on the middle slopes of Nine-mile Mountain. A young bird shot there on July 23 had nearly finished the post-juvenal molt; an adult taken August 2 was nearly through the annual molt. A number seen forty miles north of Hazelton, September 12, in Hudsonian Zone surroundings. One noted in Kispiox Valley, August 31, and several toward the base of Rocher Déboulé, southeast of Hazelton, September 22. Four specimens collected (nos. 42225–42228).

Corvus brachyrhynchos hesperis Ridgway. Western Crow

A few crows were seen in the immediate vicinity of Hazelton during the latter part of May and the first two weeks in June. None was seen later in the summer or at any other point. Four specimens collected, two adult males and two adult females (nos. 42229–42232).

Agelaius phoeniceus arctolegus Oberholser. Northern Red-wing

An immature male that was collected in Kispiox Valley, September 7 (no. 42233), was the only red-winged blackbird seen; its capture constitutes an extreme northwestern point of record for the species. This bird has a remarkably heavy bill. In depth of bill at base (14 millimeters) it reaches the maximum of this measurement as given by Oberholser (1907, p. 335) in his description of the subspecies *arctolegus*.

Euphagus carolinus (Müller). Rusty Blackbird

Fairly common in the lowlands about Hazelton and in Kispiox Valley, but so quiet and secretive during the nesting season as easily to be overlooked. A female shot June 4 had laid part of its set. On July 5 a flock of old and young together first appeared. An adult female shot August 20 had nearly finished the annual molt; an immature male taken September 9 had finished the post-juvenal molt. The species was present in abundance at the end of my stay, September 26. By the middle of September the birds had gathered into flocks of from twenty to fifty individuals. Thirteen specimens collected (nos. 42234–42246).

Hesperiphona vespertina brooksi Grinnell.
British Columbia Evening Grosbeak

Small flocks seen near Hazelton during the last week in May and the first week in June. No evidence of breeding was found. Three specimens collected, two adult males and one adult female (nos. 42247–42249). This, I believe, is the northernmost record for the species in British Columbia. (For characterization of the subspecies *H. v. brooksi*, see Grinnell, 1917, p. 20.)

Carpodacus purpureus purpureus (Gmelin). Eastern Purple Finch

Not found above the floor of the valley. Single birds and small flocks seen about Hazelton the latter part of May and in June; a female shot June 4 was incubating eggs. In Kispiox Valley, the latter part of August, purple finches were seen occasionally, the last on August 29. Seven specimens collected, four red males, one male in the streaked plumage, and two females. These are all typically of the subspecies *purpureus*.

Loxia leucoptera Gmelin. White-winged Crossbill

Small flocks (eight to twelve birds each) seen at Hazelton, June 14, in Kispiox Valley, July 8, and again near Hazelton the latter part of September. On Nine-mile Mountain (July 21 to August 14), white-winged crossbills were present in small numbers in the hemlock forest immediately below timber line, that is, four or five individuals might be seen during a forenoon. This was evidently the nesting ground, as single males were spaced at intervals through the woods, and were in full song. Four specimens collected, three adult females and one adult male (nos. 42257–42260).

Leucosticte tephrocotis littoralis Baird. Hepburn Rosy Finch

Seen only on Nine-mile Mountain. Not abundant, or at any rate not seen frequently. An occasional small flock or a single bird might whirl overhead now and then, or the elusive call note might be heard faintly in a gust of wind, such as often prevailed about the crags and snow banks where the rosy finches dwelt. but the birds were seldom found feeding quietly. On July 26 three adults and three young (nos. 42261–42266) were collected from a flock of several times that number. The juveniles were as large as their parents, and with wing and tail feathers grown to their full length, but they were still being fed by the old birds.

Spinus pinus pinus (Wilson). Pine Siskin

The most abundant species of bird in the Hazelton region, both in the lowlands and on the mountains, even above timber line. Present when we arrived, May 25, and at our departure, September 26. On July 19 an old bird was seen feeding a full-grown young one. Siskins were in flocks throughout the summer; there must have been many of the birds that were not breeding. Toward the end of summer the flocks increased in size. On Nine-mile Mountain, at the end of July, twenty-five to thirty was an average sized gathering; the middle of August, forty or fifty would be seen together; and by September 1 flocks numbering a hundred or more were of frequent occurrence. Two adults collected (nos. 42267–42268).

Calcarius lapponicus alascensis Ridgway. Alaska Longspur

A fairly common fall migrant. Arrived in Kispiox Valley, September 1, and from then on, during September, small flocks were seen almost daily. Two specimens collected, immature males (nos. 42269–42270).

Calcarius pictus (Swainson). Smith Longspur

An immature male (no. 42271) collected in Kispiox Valley, August 25. This was undoubtedly a migrating straggler to this point. Whether the species breeds east of the Rocky Mountains in northern British Columbia is not known, but it may very well do so. The one previous record for the province is of a single bird taken at the summit of "Boundary Pass" (the extreme southeastern corner of British Columbia), May 15, 1858 (Blakiston, 1862, p. 6; 1863, p. 72).

Calcarius ornatus (J. K. Townsend). Chestnut-collared Longspur

An adult female (no. 42272) in worn summer plumage collected in Kispiox Valley, July 8. I do not believe that this bird was breeding at the point where it was taken; it was most likely a wanderer that had strayed far from the breeding grounds. This is an even more extraordinary occurrence than the capture of the Smith longspur six weeks later at the same place. The latter species is known to breed to the northeast of this region, and a slight deflection to the westward by a south-bound migrant would account for the stray we collected. The chestnut-collared longspur, however, is not known to breed nearly so far north as this in the interior; presumably it required a long flight to the northwest to bring this bird to the place where it was found. I believe that this is the first recorded occurrence of the species in British Columbia.

Passerculus sandwichensis alaudinus Bonaparte.

Western Savannah Sparrow

There were a few Savannah sparrows migrating through Hazelton during the last week in May. In Kispiox Valley a little later small numbers were breeding in hay fields and pastures. In the open country at the summit of Nine-mile Mountain (5000 to 5500 feet altitude) the species was breeding in fair abundance. In Kispiox Valley again, the third week in August, there was an influx of migrating Savannah sparrows; they came in swarms, reaching the maximum of abundance about the middle of September. Some were seen up to the day I left, September 26.

Nineteen specimens collected (nos. 42273–42290, 42410): at Hazelton, May 30, two, adult male and female; Kispiox Valley, adult female, July 9; juvenal male, July 12; two adult females, four immature females, three immature males, August 24 to September 10; Nine-mile Mountain, July 23 to 29, three adult males, three adult females. The Nine-mile Mountain specimens are *alaudinus;* they are exactly like Savannah sparrows from more northern points in the interior of British Columbia and Alaska. The status of the Savannah sparrow breeding in the lowlands of the region cannot be settled at this time. The one adult collected that was actually breeding (no. 42275, female, Kispiox Valley, July 9), is of small size and with short, stubby bill. The two shot at Hazelton on May 30 were not breeding; they may or

may not have been about to nest nearby. They, too, are of rather small size and with short bill, as compared with typical *alaudinus*. The juvenal from Kispiox Valley, compared with young of *alaudinus* from Kotzebue Sound, is slightly darker colored and with noticeably more stubby bill. Savannah sparrows taken in Kispiox Valley during late August and early September are *alaudinus*, presumably migrants from the northward.

To summarize: The Savannah sparrow breeding on the mountain tops of this region is *Passerculus sandwichensis alaudinus*. The Savannah sparrow breeding in the lowlands appears to be another race. Presumably it would be *Passerculus sandwichensis brooksi* (Bishop, 1915, p. 187), described from the lowlands of southern British Columbia. There is no series of *brooksi* available for comparison. For the present the entire series from the Hazelton region may be left under the name *alaudinus*. None of the lot bears any close resemblance to *Passerculus sandwichensis savanna* of the coast of southeastern Alaska, a short distance to the westward.

Zonotrichia leucophrys gambeli (Nuttall). Gambel Sparrow

A fairly common summer visitant, restricted to the lowlands. When we reached Hazelton, May 26, Gambel sparrows were evidently nesting. Singing males were established in many of the gardens in the town; elsewhere scattered pairs were encountered at rather wide intervals in sparse timber. In Kispiox Valley a few were seen early in July; by the middle of the month they had disappeared. This species is remarkably secretive in its nesting. Specimens in the juvenal plumage were desired and special search made for them, but, although adults were seen in fair abundance, not only were no nests discovered but not a single young bird was seen. Then, the second week in July, came the apparent disappearance of the species for a period of several weeks. On August 24 a bird in first winter plumage was shot, the first of a migratory wave, and the next day the bushes were full of Gambel sparrows. These were all immatures, with brown head stripes; the first adult was seen September 1. When I left, September 26, the species was still fairly abundant.

Six specimens collected (nos. 42291–42296), three adult males, one adult female, and two immature males.

Zonotrichia coronata (Pallas). Golden-crowned Sparrow

Breeding in fair abundance above timber line on Nine-mile Mountain. When we arrived there (July 22) the young were out of the nest and flying about; the old birds could be seen singing from perches above the thickets in which they dwelt. Specimens in juvenal plumage were among our special desiderata and every effort was made to shoot them, but so wary were these young birds that we deemed ourselves lucky to get even the three we eventually collected. At the first sign of danger a loud *chip* from the parent sends every youngster within hearing scuttling for the nearest tangle of prostrate balsam, but not to remain there. A prompt retreat is made to the far side of the bush, followed quickly by flight to another thicket perhaps a hundred yards away. Pursuit is heralded by warning alarm notes from the parent, and the youngster again flees to another refuge. Further pursuit is generally useless. In fact, young birds were seen to go five hundred yards or more in one flight when followed up. Meanwhile, the old bird, perhaps joined by others, remains nearby, giving warning from some conspicuous perch, utterly indifferent to approach within a few yards. The warning *chip* of the adult golden-crowned sparrow was a familiar note in the balsam thickets along the ridges. It accompanied us nearly everywhere in our travels on the summit.

The extreme wariness of the young golden-crowned sparrow is a trait that receives emphasis from the fact that, when the first winter plumage is attained a few weeks later, these same young birds are peculiarly tame and unsuspicious. Then they will permit of close approach, will in fact come themselves to inspect the stranger in the woods.

The first migrating golden-crowned sparrow appeared in the lowlands, in Kispiox Valley, on September 1. For a short time thereafter they were fairly common.

Six specimens collected (nos. 42297–42302): two adult males, two juvenal males, and one juvenal female from Nine-mile Mountain; one immature male from Kispiox Valley. The three young (collected July 25, 26) are in juvenal plumage throughout. They are heavily streaked above and below, save on the center of the abdomen, and are generally similar to the same stage in the various races of *Zonotrichia leucophrys*. Compared with juvenal *Z. l. leucophrys*, young *coronata* is darker throughout, the ventral streaking is darker, heavier, and more extensive, and the lateral crown stripes are less plainly indicated.

Compared with young *Z. l. nuttalli* (which is darker-colored than *leucophrys*), young *coronata* is again darker, more reddish dorsally, more heavily streaked ventrally, and with less plainly indicated crown stripes. Tip of bill and most of upper mandible is blackish; base of bill and most of lower mandible, yellowish. Feet are whitish; eyes dark.

Zonotrichia albicollis (Gmelin). White-throated Sparrow

An adult male (no. 42303), one of a mated pair, was collected in Kispiox Valley, June 21. The female was seen repeatedly at the same place, a partly cleared pasture with scattered thickets of second growth, and remained there up to the time of our departure, July 15. When we returned late in August, she had gone. This, I believe, is the farthest northwest that this species has been found.

Spizella monticola ochracea Brewster. Western Tree Sparrow

One specimen collected (no. 42304), an immature female at Kispiox Valley, September 13. This was evidently a forerunner of the fall migration; the species was not breeding in this general region.

Spizella passerina passerina (Bechstein). Eastern Chipping Sparrow

Fairly common in the lowlands about Hazelton when we arrived, May 26, and evidently settled upon the nesting ground. A female collected June 8 had laid part of its set; by the middle of July young out of the nest were seen. The chipping sparrows apparently leave for the south at an early date. By the middle of August their numbers had decreased markedly; one in juvenal plumage, collected August 22, was the last seen. The species was encountered only in the lowlands.

Eight specimens collected (nos. 42305–42312), two adult males, five adult females, one juvenal male. To my eye the chipping sparrow of northern British Columbia is much nearer to the eastern *passerina* in appearance and measurements than to typical *arizonae*.

Junco hyemalis hyemalis (Linnaeus). Slate-colored Junco

Seen, not abundantly, during the fall migration. The first was collected August 29; no more appeared until September 13. During the next two weeks they were encountered almost every day. Ten specimens collected (nos. 42316–42325), nine males and one female, all immatures in first winter plumage.

Junco hyemalis connectens Coues. Cassiar Junco

There were a few of this species breeding in Kispiox Valley, twenty-three miles north of Hazelton, the extreme southern limit of the breeding range. *Junco oreganus shufeldti* was the common species, present in large numbers, but at least two pairs of *connectens* were observed, and they were evidently nesting. An adult male (no. 24313) was taken on June 22, and an adult female (no. 42314) with a juvenile (no. 42315) on July 9.

I expected to find *connectens* appearing in numbers at the beginning of the fall migration, but the slate-colored juncos that were collected at that time are nearly all like typical *hyemalis* rather than like our Stikine River series of *connectens* (see Swarth, 1922, p. 243). One specimen (no. 42326), an immature male taken in Kispiox Valley, September 13, does appear to be *connectens*. The female of that form frequently is so much like female *shufeldti* in appearance that the two are distinguished in life with difficulty, which may be one reason why specimens were not taken.

Junco oreganus shufeldti Coale. Shufeldt Junco

Abundant nearly everywhere. On May 26, at Hazelton, a nest was found with eggs just hatching; on June 6 the first young were seen flying about. On July 19 a nest was found, just finished but with no eggs as yet, an unusually late date. On Nine-mile Mountain (July 21 to August 13) a great many juncos were seen, mostly spotted young, frequenting the open slopes and basins immediately above timber line. By the first week in September the molt had been accomplished by most of the juncos and they were then gathered in flocks of from ten to twenty birds. They were present, though in diminished numbers, when I left, the last week in September.

Fifty-four specimens collected (nos. 42327–42380): eight breeding adults (seven males and one female), seventeen in juvenal plumage or undergoing the post-juvenal molt, three adult males and one adult female in winter plumage, and twelve males and thirteen females in immature (first winter) plumage.

This series from the Hazelton region may be taken as representative of conditions at the northwestern limit of the subspecies *shufeldti*. Breeding birds show a tendency toward *Junco hyemalis connectens*, of the country immediately to the northward, exhibited mostly in the grayer dorsum. The flocks of birds in fresh fall plumage yielded no

specimens showing this sort of variation, but they did contain a percentage of individuals with a decided leaning toward *Junco oreganus oreganus*. This might be taken to indicate a slight migratory movement inland at the end of the summer from the region to the westward. Typical *oreganus* inhabits the coastal region less than two hundred miles west of Hazelton. Some of the fall specimens taken, if collected on the coast, might be considered as *oreganus;* they come within the limits of variation of that subspecies, though not exhibiting *oreganus* characters in their extreme.

Melospiza melodia morphna Oberholser. Rusty Song Sparrow

In the immediate vicinity of Hazelton there is not much country suitable for this species and it occurs as scattered pairs in little swales or along small streams. In Kispiox Valley, in the marshes and pastures, it was abundant. None was seen in the mountains. Song sparrows were present, apparently paired and nesting, when we arrived at Hazelton, May 26. A young bird being fed by its parents was seen as late as August 29. By the third week in September the song sparrows were mostly gone; one was seen on September 23.

Twenty-one specimens (nos. 42381–42401) collected, as follows: six breeding adults, one adult in fresh fall plumage, eight immatures in first winter plumage, and six juveniles. (For use of the subspecific name *morphna* for the song sparrow of this region see Swarth, 1923, p. 214.)

Melospiza lincolni lincolni (Audubon). Lincoln Sparrow

Exceedingly numerous in the lowlands; next to the siskin probably the most abundant species of bird. There were some even at the summit of Nine-mile Mountain; young in juvenal plumage were seen there during the fourth week in July.

At Hazelton, male birds singing in the gardens were noted May 30; a young bird just out of the nest was collected June 23; young in completely acquired first winter plumage were taken during the third week in August; an adult nearly through the annual molt, August 26. During the latter part of August, in Kispiox Valley, the species was peculiarly abundant. Fifteen or twenty might be routed out of a thicket at once, and some birds might be found at any point where one cared to search for them. By the second week in September their numbers had decreased markedly; the last was noted on September 14.

Thirteen specimens collected (nos. 42402–42409, 42411–42415): five breeding adults, one adult and four immatures in fresh fall plumage, and three birds in juvenal plumage.

Passerella iliaca iliaca (Merrem). Eastern Fox Sparrow

On September 14, two fox sparrows were shot from a flock of five or six flushed from a thicket. The two collected proved to be of the subspecies *iliaca,* and from the glimpses I had of the others they all appeared to be the same. The two specimens collected (nos. 42416, 42417) are females in completely acquired first winter plumage. One is typical of the subspecies *iliaca* in every respect. The second, though obviously of this same subspecies, is darker colored than the mode, and not so conspicuously streaked on the back. It is more nearly uniform reddish above. Near Hazelton, on September 22, a single fox sparrow (no. 42418) was collected, an immature male. It is closely similar to the second bird just described, perhaps a trifle darker and more uniformly reddish. These birds were undoubtedly migrants from farther north.

The only previous record of the eastern fox sparrow in British Columbia is of a specimen collected at Sicamous, September 25, 1893 (Swarth, 1920, p. 118).

Passerella iliaca altivagans Riley. Alberta Fox Sparrow

Breeding, not abundantly, at and a little above timber line on Nine-mile Mountain. In the same general area as the golden-crowned sparrow and in similar surroundings, though not so much in the balsam thickets as in tangles of alder and veratrum. Constantly heard singing but so shy generally as to avoid observation. The young birds (July 22 to August 13) were flying about; mostly they were in process of change from juvenal to first winter plumage. In Kispiox Valley the first migrating fox sparrow of this subspecies appeared on August 29, and a few more were seen at intervals up to September 7.

Fourteen specimens collected (nos. 42419–42432): on Nine-mile Mountain, two adults (male and female), six in juvenal plumage and in the post-juvenal molt; in Kispiox Valley, three males and three females, all in first winter plumage. These birds, though properly referred to *altivagans* (see Riley, 1911, p. 234), are not typical of that subspecies. In more uniform coloration above and in darker streaking below they show an unmistakable trend toward the darker coastal

races whose habitat they approach so nearly. There is hardly a trace in any specimen of the obscure dorsal streaking seen in *altivagans* from more southern and eastern stations. The Kispiox Valley migrants are even more questionably referred to *altivagans* than the Nine-mile Mountain specimens. Our collecting station in that valley was northwest of Nine-mile Mountain. Migrating fox sparrows collected there must have traveled from somewhere still farther north, possibly from some region even nearer the coast. These migrating birds in appearance are not unlike some specimens of *sinuosa*. They differ in shape of bill and in darker, less reddish, coloration, especially dorsally. I believe that they are unquestionably intergrades between *altivagans* and the nearby coastal subspecies, *fuliginosa*. When such birds are taken far to the southward, in the winter habitat, it is admittedly difficult to recognize their true relationships (though similar specimens passing through my hands have been hesitatingly labeled *altivagans*), but in this case the place of capture affords a valuable clew. No undoubted specimens of *sinuosa* have been found migrating anywhere in the interior of Alaska or British Columbia.

Piranga ludoviciana (Wilson). Western Tanager

Rather uncommon summer visitant in the lowlands. First noted near Hazelton on June 3, when two were seen ond others heard calling. Not more than ten or twelve, all told, seen during the summer, the latest on August 30. Four specimens collected (nos. 42433–42436), an adult male, and three immature males.

Hirundo erythrogaster Boddaert. Barn Swallow

A few pairs were nesting in buildings in Hazelton. Elsewhere, an occasional bird passing overhead was all that was seen. First noted on June 1. On July 20 small flocks were observed flying southward, apparently migrating.

Iridoprocne bicolor (Vieillot). Tree Swallow

Abundant in the lowlands, and already nesting when we reached Hazelton, May 26. Seen entering crevices in buildings in the town, and old woodpecker holes in trees elsewhere. Apparently migrates south at an early date for none was seen after our descent from the mountains, August 14. One specimen collected, an adult male (no. 42437).

Tachycineta thalassina lepida Mearns. Northern Violet-green Swallow

The most abundant species of swallow. Like the tree swallow it was nesting when we arrived, the end of May, and, similarly, occupying sites in buildings in town and on the farms. Seen only in the lowlands. The latter part of August the species disappeared, and I supposed had already gone south, but on September 24 and 26 large flocks appeared circling about over Hazelton.

Stelgidopteryx serripennis (Audubon). Rough-winged Swallow

Breeds in small numbers about Hazelton and in Kispiox Valley, twenty-three miles to the northward. Present when we arrived, the end of May. Seen only in the lowlands, and not met with after our return from the mountains, the middle of August.

Bombycilla garrula pallidiceps Reichenow. Bohemian Waxwing

First seen in Kispiox Valley, July 5. Five birds appeared, and three were collected. They seemed to be birds that had finished nesting. Next encountered August 22, a flock of twenty or more at the same place. During the remainder of our stay flocks numbering from ten to twenty were seen occasionally, generally flying overhead, in Kispiox Valley and about Hazelton. Five specimens (nos. 42438–42442) were collected, all adults. One bird shot August 22 is just beginning the annual molt; another, taken August 27, is in the midst of it. Both these molting birds have new tail feathers (some of them less than half-grown) and in one specimen the yellow-marked wing feathers also are new. It is a curious fact that these yellow markings, especially those on the tail, are not so brilliant in these adult birds as they are in certain nestlings at hand. (For description of these young birds see Swarth, 1922, p. 279.) In the juveniles the tail band is decidedly orange, a color not seen in any other specimen examined, summer or winter. Winter flocks must be composed largely of young of the previous season, and the absence of any birds with orange colored tail band probably means that this color fades appreciably soon after the feathers get their growth. It seems strange, though, that similar changes cannot be traced in the rectrices of the adult.

There is a slight difference in the sexes of the Bohemian waxwing described by Tischler (1918, p. 85) that had apparently escaped the notice of earlier observers. In his opinion the only passably sure mark

of difference lies in the coloration of the throat. In the males the black is darker, more extended and sharply separated from the rest of the underparts. In the females the throat patch is smaller, duller, and not so sharply delimited, fading more gradually into the gray of the underparts. The present writer has tested this character on two occasions, series of Bohemian waxwings being laid out with the labels hidden from view, and the sexes then separated by the above criterion. In each case the division was made without a mistake.

(For use of the name *pallidiceps* see Reichenow, 1908, p. 191.)

Bombycilla cedrorum Vieillot. Cedar Waxwing

On June 17 a small flock was seen near Hazelton. Others were noted in Kispiox Valley a few days later; by the last week in June these flocks were breaking up into pairs. When we returned, the middle of August, nesting was finished and young and old were gathered in flocks once more. During the last two weeks in September cedar waxwings were seen daily about Hazelton.

Seven specimens collected, five adults and two juveniles (nos. 42443–42449). An old bird shot August 22 is just beginning the annual molt; another collected September 5 has finished it. One young bird still in juvenal plumage throughout was collected September 5. One of the two juveniles has small but distinct red tips to four secondaries on each wing, whereas in four of the five adults these markings are utterly lacking.

Vireosylva olivacea (Linnaeus). Red-eyed Vireo

Fairly common in poplar woods near Hazelton. On the evening of June 7 the first arrival was heard singing; the next day a number were encountered. Hazelton is apparently the northern extreme reached by the red-eyed vireo, none being seen in Kispiox Valley, a few miles farther north. Five specimens collected, four adult males and one adult female (nos. 42450–42454).

Vireosylva gilva swainsoni (Baird). Western Warbling Vireo

Fairly common in the lowlands. Present when we reached Hazelton (May 26), and beginning breeding activities. On June 3 a warbling vireo was seen at work at a nest. The species remained in fair abundance through August, leaving rather abruptly at the end of that

month. Last seen September 3. Eight specimens collected, five adult males, and two males and one female in first winter plumage (nos. 42455–42462).

Vermivora celata celata (Say). Orange-crowned Warbler

An orange-crowned warbler in juvenal plumage (no. 42463), collected on the summit of Nine-mile Mountain, July 31, is either of the subspecies *celata* or *orestera*. The young of these subspecies are difficult to distinguish, but as no undoubted examples of *orestera* were taken I am ascribing this individual to the race *celata*, of which other specimens were collected. *Celata* may well have been breeding on Nine-mile Mountain, but the presence of this young bird cannot be taken as proof, for a juvenile *lutescens* also was collected during the same week. It is most unlikely that both subspecies were breeding there, but which (if either) was nesting, and which the migrant, was not ascertained.

Migrating *celata* first appeared in Kispiox Valley on August 26, and until September 14 was of daily occurrence. Eight specimens collected (nos. 42464–42471), three males and five females, all immatures in first winter plumage.

Vermivora celata lutescens (Ridgway). Lutescent Warbler

A young lutescent warbler (commented upon above), in juvenal plumage throughout (no. 42472), was collected at the summit of Nine-mile Mountain, July 24, an immature female in first winter plumage (no. 42473), in Kispiox Valley, August 28. These are all that were seen of this subspecies, and presumably they were migrants from the coast. It is possible, however, that *lutescens* occasionally breeds this far inland, at high altitudes. A bright colored warbler of this species (subspecies uncertain) was seen near Hazelton on May 27, among the last of the spring migrants to pass through.

Vermivora peregrina (Wilson). Tennessee Warbler

A rare summer visitant. A male bird was seen singing near Hazelton on June 2, and another observed in a garden in the town on July 19. On June 22, in Kispiox Valley, a male (no. 42474) was collected, and his mate seen. On July 10, at the same place, a pair of Tennessee warblers was discovered making a great fuss over some young hidden in a thicket nearby. These were the total of records for the summer.

Dendroica aestiva rubiginosa (Pallas). Alaska Yellow Warbler

Yellow warblers were extremely scarce, in notable contrast to the abundance in which I found them on the upper Stikine River, two hundred miles to the northward (see Swarth, 1922, p. 287). Furthermore, the yellow warbler of the upper Stikine is the eastern subspecies, *D. aestiva aestiva,* that of the upper Skeena is the coastal subspecies, *D. aestiva rubiginosa.* The scarcity of this bird in the migrations as well as in midsummer shows that the travels of *aestiva* to and from its more northern breeding ground follow a northwest-southeast line that lies to the eastward of Hazelton.

The first yellow warbler was seen near Hazelton on June 6; from then on a few were encountered from time to time through the summer. On June 23, in Kispiox Valley, a nest was found containing five eggs. On Nine-mile Mountain, the first week in August, several yellow warblers were seen, presumably migrants; during the latter part of the month a very few were observed migrating in Kispiox Valley, the last on August 22.

Five specimens (nos. 42475–42479) collected. Three breeding birds (one male and two females) are unequivocally *rubiginosa.* Two adult females just finishing the annual molt, taken August 19 and 22, respectively, are not so certainly of that subspecies. They may be migrating individuals of *aestiva* from farther north, but their molting condition and the lack of comparable specimens in the several subspecies precludes a decision.

Dendroica coronata hooveri McGregor. Alaska Myrtle Warbler

Myrtle warblers had already passed through on their northward journey when we reached Hazelton, May 26. In the fall they appeared in numbers, abruptly; on September 10 the first one arrived, on the 11th they were abundant. They were still present when I left, September 26. Two specimens collected, immatures in first winter plumage (nos. 42480–42481).

Dendroica auduboni auduboni (J. K. Townsend). Audubon Warbler

Fairly common in the lowlands through the summer, both at Hazelton and in Kispiox Valley to the northward; not seen at high altitudes. Present when we arrived, May 26, and apparently then in pairs. During the first week in September the Audubon warblers

began to disappear. The last to be positively identified as such was seen on September 9, but Alaska myrtle warblers arrived from the north in numbers a day or two later and the two species are sufficiently alike so that a few Audubon warblers might have lingered somewhat later and been overlooked.

Thirteen specimens collected (nos. 42482–42494): nine summer adults (six males, three females), three males in first winter plumage, and one male in juvenal plumage. These birds were taken at the northernmost points at which the Audubon warbler has been found. Two hundred miles farther north, in the Telegraph Creek region, it is replaced by the Alaska myrtle warbler, there near its southern limit (see Swarth, 1922, p. 289). Comparing the two series, *auduboni* from the upper Skeena Valley and *hooveri* from the upper Stikine Valley, there cannot be seen the least approach of one to the other. Specimens of *auduboni* from its northern limit are exactly like others from California; specimens of *hooveri* from its southern limit show no departure from the characters of specimens from northern Alaska. The two species, though closely related, evidently preserve their distinctness where their ranges most closely adjoin. It would be interesting to ascertain if there is any place between Hazelton and Telegraph Creek where both species breed. A hybrid between the two has been described (Taylor, 1911).

Dendroica magnolia (Wilson). Magnolia Warbler

Fairly common summer visitant to the lowlands about Hazelton, where it arrived June 3. In Kispiox Valley, June 21 to July 15, it was decidedly rare, not more than five or six birds being seen in that period of time. At the same place when the migration began, the third week in August, magnolia warblers became more numerous and they were seen daily up to the first week in September. Last noted on September 5. Six specimens collected (nos. 42495–42500), two adult males, one adult female, two immature males, one immature female.

Dendroica striata (J. R. Forster). Black-poll Warbler

Two immature males (nos. 42501–42502), migrants, were collected in Kispiox Valley on August 18 and September 1, respectively. No others were seen.

Dendroica townsendi (J. K. Townsend). Townsend Warbler

This species may have been breeding in the Hudsonian Zone on Nine-mile Mountain. Two were seen there, one observed in hemlock woods just below timber line on July 30, and one collected on August 5. The latter is still largely in juvenal plumage. Townsend warblers appeared in Kispiox Valley the latter part of August, migrating. First seen August 27, and thereafter, in small numbers, until September 15. Four specimens collected (nos. 42503–42506), one young bird from Nine-mile Mountain and three immature females from Kispiox Valley.

Seiurus noveboracensis notabilis Ridgway. Grinnell Water-thrush

Breeding in fair abundance along marshy streams in Kispiox Valley. A young female mostly in juvenal plumage was collected July 14; a young male but slightly more advanced in the post-juvenal molt was taken August 27. Seven specimens in all collected (nos. 42507–42513), the two juveniles mentioned, two adults (male and female), and three in first winter plumage (two males, one female).

Oporornis tolmiei (J. K. Townsend). MacGillivray Warbler

Abundant summer visitant to the lowlands; one of the commonest birds of the region. First seen on June 6 though possibly present at an earlier date. A nest with four eggs (no. 1856) was found in Kispiox Valley on June 22. Remained in considerable numbers until September; last seen September 14. Three specimens collected (nos. 42514–42516), adult male, adult female, and one bird in first winter plumage.

Geothlypis trichas occidentalis Brewster. Western Yellowthroat

Breeding in fair abundance in Kispiox Valley, but secretive in habit and easily overlooked. Last seen September 12. Eleven specimens collected (nos. 42517–42527), two adults (male and female), four males and four females in first winter plumage, and one male in juvenal plumage.

Wilsonia pusilla pileolata (Pallas). Pileolated Warbler

On May 26 and 27 (our first days at Hazelton), pileolated warblers were migrating abundantly through that region. They then abruptly disappeared, one shot on May 30 being the only other one seen in the spring, and were not found breeding anywhere in the lowlands. An adult male shot near the summit of Nine-mile Mountain, July 30, was just beginning the annual molt. It was one of two birds seen together, perhaps a mated pair nesting there. An immature male taken at the same place August 11 was in first winter plumage throughout, and may have been a migrant. The three were the only birds of this species seen upon the mountain.

The first migrant appeared in Kispiox Valley on August 19. Pileolated warblers were then fairly common until the first week in September; the last was seen September 11. Six specimens in all collected (nos. 42528–42533): two adult (summer) males, one adult male in fresh fall plumage, and three immature males.

Setophaga ruticilla (Linnaeus). American Redstart

Abundant in the lowlands. Present when we reached Hazelton, May 26, and in increasing numbers during the next few days. Several nests were found in Kispiox Valley late in June and early in July, all very similar in structure and location. The usual site was an upright fork of willow or alder, from eight to fifteen feet from the ground. The supporting branches were generally so large as nearly to conceal the tiny nest, or else to make it appear as part of the fork. Nests were in exposed situations more often than in thick shrubbery, sometimes in dead branches, but nevertheless, because of this peculiarity of construction, they were not easy to see. One nest collected (no. 1857, Kispiox Valley, June 27) contained four eggs; others examined held either two eggs or two young birds.

Redstarts remained in fair abundance until the end of August; the last was seen September 8. Unlike some species, of which the adults leave ahead of the young, sometimes before the molt, the adult redstarts seemed to linger quite as late as the juveniles. The adult males, of course, are readily distinguishable, contrary to the rule covering most small birds in the fall, and the number that were seen justifies the statement. An adult female was collected August 29, an adult male September 7. Thirteen specimens in all taken (nos. 42534–42546).

Anthus rubescens (Tunstall). Pipit

A large flock that was seen near Hazelton on May 26 was the last migrating band to pass through. The species was next encountered on the summit of Nine-mile Mountain, where it was breeding in small numbers. A special effort was made there to get birds in the juvenal plumage, but the young were extremely wary, in striking contrast to the tameness of their parents, and only one was collected. Pipits reappeared in the lowlands, in Kispiox Valley, on September 2, and were seen in fair abundance there and at Hazelton until September 20.

In Kispiox Valley, September 4, two pipits were collected, the two together and not otherwise accompanied. One was still mostly in juvenal plumage. The other, in fully acquired winter plumage, I assumed to be an attending parent, but on dissection it proved to be an immature bird. The occurrence is of interest, first, as indicating that a young bird still in juvenal plumage can start to migrate and travel a considerable distance, for the juvenal mentioned must have come a long way from where it was hatched, if only from the nearest mountain top; and secondly, as demonstrating the early age at which a young bird can care for itself, independent of its parents.

Pipits in late March and early April undergo an extensive molt whereby the breeding plumage is acquired. In this plumage the upper parts are grayish, compared with the brown winter plumage, and the lower parts cinnamon buff. The female, as compared with the male, is less gray (more brownish), above, and more heavily spotted below. The cinnamon is evanescent, and by the end of July has almost all faded away. Then, by the fall molt, in late August and early September, the winter plumage is acquired, differing from the breeding garb in being brown above and more heavily streaked below, but, in both old and young, distinctly cinnamon tinged ventrally. Again the cinnamon fades out and by the end of November the birds are dull brown above, and whitish, streaked with dusky below, as we usually see them in their winter home.

Thirteen specimens collected (nos. 42547–42559).

Dumetella carolinensis (Linnaeus). Catbird

On June 10 a catbird was shot within a stone's throw of the railroad station at Hazelton. This bird (no. 42560) was an adult male and in breeding condition, but his mate was not seen, nor was any other of the species encountered during the summer. This, I believe, is a material extension northwestward of the range of this species.

Troglodytes aedon parkmani Audubon. Western House Wren

An adult male (no. 42561) was collected in Kispiox Valley on July 2, the only one seen during the summer. It had the appearance of a breeding bird. This is considerably farther north than the species has heretofore been found in British Columbia.

Nannus hiemalis pacificus (Baird). Western Winter Wren

Breeding in dense spruce woods on the higher slopes of Nine-mile Mountain. Young out of the nest were seen July 30, and the same day an adult was encountered that was carrying feathers as though engaged in nest building. Winter wrens appeared in the lowlands at the end of the summer. First noted in Kispiox Valley on September 10; others were seen at intervals during the rest of the month. Three specimens collected (nos. 42562–42564), an adult and two juveniles from Nine-mile Mountain.

Certhia familiaris occidentalis Ridgway. Tawny Creeper

One in juvenal plumage taken on Nine-mile Mountain, July 29; on August 28 a creeper was seen in Kispiox Valley. These are all that were noted during the summer. The specimen collected (no. 42565) is nearest *C. f. occidentalis* in appearance, though not so reddish above as extremes of that subspecies.

Sitta canadensis Linnaeus. Red-breasted Nuthatch

Breeds in small numbers in the lowlands and more abundantly at high altitudes. On Nine-mile Mountain some were seen daily in the hemlock forest just below timber line. A nest was found in Kispiox Valley, placed in a dead stub at the edge of rather dense poplar woods. The stub was perhaps four or five inches in diameter at the base, and was broken off about twenty feet from the ground. The nest hole was near the top and was about one and one-half inches in diameter. On July 12 it contained at least two young birds, nearly ready to fly, whose heads could be seen protruding from the opening. They called incessantly, uttering the characteristic nasal *yang* of the species until either parent appeared, when this was changed to a hissing and squalling, like most other young birds appealing for food.

In August and September red-breasted nuthatches became fairly common in the lowlands, frequently seen in company with chickadees, kinglets, or migrating warblers. One specimen collected (no. 42566), an adult male taken in Kispiox Valley, July 2.

Penthestes atricapillus septentrionalis (Harris).

Long-tailed Chickadee

Of general distribution in the lowlands though nowhere abundant. Not encountered in the mountains. One specimen still in the juvenal plumage was collected on September 5, but by the last week in August both adults and young had for the most part finished the molt. At that time the species seemed much more abundant than earlier in the year; a flock of chickadees usually served as a nucleus around which were gathered a few individuals of various other species, such as kinglets, warblers, and nuthatches. Seven specimens collected (nos. 42567–42573).

Penthestes gambeli abbreviatus Grinnell.

Short-tailed Mountain Chickadee

Seen only on Nine-mile Mountain, in spruce and hemlock woods just below timber line, at about 4500 feet altitude. Small flocks seen, on July 30 and again on August 10. Two specimens collected, an adult male (no. 42574) in extremely worn plumage, shot on July 30, and a juvenile female (no. 42575), collected on August 10. (For use of the name *abbreviatus* see Grinnell, 1918, p. 510.)

Penthestes hudsonicus columbianus (Rhoads). Columbian Chickadee

Found only near the summit of Nine-mile Mountain. On July 30 and on August 10 Hudsonian chickadees were seen, each time in company with mountain chickadees. Four specimens collected (nos. 42576–42579), a male and three females, all in juvenal plumage. Eight adults at hand from more southern points in British Columbia (Okanagan, Edgewood, Gold Range, Pearson Mountain, and Mabel Lake) bear out the color characters ascribed to the subspecies *columbianus* (Rhoads, 1893, p. 23; Ridgway, 1904, p. 414) and thus justify the use of that name for the British Columbia Hudsonian chickadee. There are no young birds at hand from the known habitat of *columbianus,* nor any of typical *hudsonicus,* for comparison with the young birds taken on Nine-mile Mountain. The last mentioned, however, are appreciably darker colored than adult *hudsonicus* and of about the same shade as *columbianus,* so it seems safe to regard them as *columbianus.*

Penthestes rufescens rufescens (J. K. Townsend)

Chestnut-backed Chickadee

Apparently occurs this far inland as a rare migrant in late summer. On August 24 two were seen in Kispiox Valley and one (no. 42580) was collected, a male in juvenal plumage. On September 23 a small flock was encountered near Hazelton and one bird (no. 42581) was shot, a male in first winter plumage.

Regulus satrapa olivaceus Baird. Western Golden-crowned Kinglet

Breeds in small numbers in the lowlands near Hazelton and more abundantly in the nearby mountains. In the valley an occasional pair found shelter in spruces growing about little muskegs, and some were seen in a dense stand of cedar toward the base of Rocher Déboulé. On Nine-mile Mountain the species was rather more abundant; by the end of July flocks of old and young together appeared near our camp. In Kispiox Valley, the second week in September, flocks of golden-crowned kinglets were frequently encountered. Two specimens collected, an adult male near Hazelton, June 3 (no. 42582), and a juvenile male on Nine-mile Mountain, July 31 (no. 42583).

Regulus calendula calendula (Linnaeus). Ruby-crowned Kinglet

In manner of occurrence about the same as the golden-crowned kinglet. In the lowlands, an occasional ruby-crown was heard singing in spruces about the muskegs; on Nine-mile Mountain the species was a little more abundant, in spruce and hemlock forests immediately below timber line. In Kispiox Valley an influx of ruby-crowned kinglets began about September 1. They were not numerous, but one or two could usually be found in the mixed flocks of chickadees and warblers that were then traveling through the woods. Some were seen up to the day of my departure, September 26.

Ten specimens collected (nos. 42584–42593), two adult males and one adult female from Kispiox Valley in June and July, two (male and female) in juvenal plumage from Nine-mile Mountain, and one adult female and one male and three females in first winter plumage from Kispiox Valley in September. These are indistinguishable from specimens of the eastern ruby-crowned kinglet from Illinois and Connecticut. They are not the paler-colored *R. c. cineraceus* of the sierras of California.

Myadestes townsendi (Audubon). Townsend Solitaire

Extremely rare, though as one was seen in Kispiox Valley on June 24, the species probably breeds in the region. Others seen on September 2, September 13 (two birds), and September 17, make up the total of observations. One specimen collected (no. 42594), an immature male taken in Kispiox Valley on September 2.

Hylocichla ustulata swainsoni (Tschudi). Olive-backed Thrush

Common in the lowlands; not seen at high altitudes. The first arrival was heard singing on June 1; on June 3 olive-backed thrushes were everywhere in the woods. In August they became very scarce, so much so that none was seen for some weeks and I supposed they had already gone south. Then, the last week in August a few reappeared, and, while not abundant, one or two were seen almost daily until late in September. The last was noted on September 21. Eleven specimens collected (nos. 42595–42605), six adult males, two adult females, and three immature males in first winter plumage.

Hylocichla guttata guttata (Pallas). Alaska Hermit Thrush

There were a few hermit thrushes on Nine-mile Mountain, breeding in the spruce and hemlock forest immediately below timber line. The song was heard occasionally and at longer intervals a glimpse was caught of one of the birds flitting through the dense shrubbery. Two specimens collected (nos. 42606–42607), both adult males, taken on July 29 and August 10, respectively. They are essentially like breeding birds from the upper Stikine River, and, as with the latter series, are not to be referred to *Hylocichla guttata sequoiensis,* a name that has been applied to the hermit thrush of this general region (see Swarth, 1922, p. 303).

Hylocichla guttata pallasi (Cabanis). Eastern Hermit Thrush

During the second week in September a very few migrating hermit thrushes appeared in the woods of Kispiox Valley. Two were shot September 10, and others seen up to September 14. The two collected (nos. 42606, 42607), both immature males in first winter plumage, are obviously not the same as the breeding bird of this region, and appear to be best referred to the eastern subspecies, *Hylocichla guttata pallasi.* They are not so bright reddish dorsally as are most eastern specimens, but they are distinctly more reddish than *guttata,* they are larger than *guttata,* and they have the buffy flanks of *pallasi.* The subspecies

pallasi has been reported as breeding at Lac La Hache, British Columbia (Rhoads, 1893, p. 58), and as migrating at Quesnelle (Brooks, 1903, p. 284).

Planesticus migratorius migratorius (Linnaeus). Eastern Robin

Found everywhere in the lowlands; absent from the dense woods of the middle altitudes on the mountains, but reappearing in the open country above timber. When we reached Hazelton, May 26, robins were already sitting on eggs. The first young out of the nest appeared on June 16; by July 1 spotted young were about in numbers. During the second and third weeks in August there was a notable scarcity of robins; by September 1 an influx of migrants had set in, and soon they were as numerous as ever. During the third week in September the southward exodus was in full swing. Day after day migrating flocks of robins trailed overhead, in loosely assembled companies and flying at a great height. There were a good many still around though, up to the time of my departure, September 26.

Eighteen specimens collected (nos. 42610–42627): six breeding adults (four males and two females), seven birds in the spotted juvenal plumage or in the post-juvenal molt, two adult males in fresh winter plumage, and one male and two females in first winter plumage.

I have ascribed this series to the subspecies *migratorius,* the form to which on the whole it bears closest resemblance, but there is considerable individual variation, with obvious intergradation toward the coastal subspecies *caurinus.* It might be that further collecting would show such intergradation to be mostly in breeding birds from this region, while September migrants, presumably from more northern points, are closer to typical *migratorius.* However, spotted young from the Hazelton region are more nearly like young *migratorius* than like *caurinus* at the same stage.

Ixoreus naevius naevius (Gmelin). Varied Thrush

Ixoreus naevius meruloides (Swainson). Northern Varied Thrush

One family of varied thrushes was found in a lowland locality, in Kispiox Valley. They were in a grove of huge cottonwood trees bordering the Kispiox River, a dark, gloomy place, grown up underneath the trees with an impenetrable tangle of devil's-club, thimble-berry, and alder, in appearance just such a jungle as this thrush frequents on the coast. Here, on June 22, a brood of young, out of the nest, were being attended by their parents. The old male was collected (no. 42628).

There were a few varied thrushes breeding on Nine-mile Mountain, in the dense woods just below timber line. An adult female (no. 42629) collected there on July 23 had laid part of its set.

The two specimens mentioned above, the only breeding birds collected, belong to the coastal subspecies, *naevius*. At the end of the summer, migrating varied thrushes of another sort appeared. The first was seen September 1, a week later they were abundant, and there were numbers in the woods about Hazelton (mostly feeding in the sumac bushes) when I left, September 26. These migrating varied thrushes, judging from three males collected (nos. 42630–42632), were of the subspecies *I. n. meruloides*.

Sialia currucoides (Bechstein). Mountain Bluebird

A summer visitant to the lowlands, not abundant but of general distribution in the more open country. Present and in pairs when we arrived at Hazelton, the last week in May. The first young bird out of the nest was seen July 4. In August the species disappeared from sight, but early in September a few migrating bluebirds appeared from time to time, and they continued to be seen until September 22, when the last was observed.

Three specimens collected, all adult males (nos. 42633–42635).

CHECK LIST OF THE MAMMALS

1. Sorex personatus personatus I. Geoffroy.
2. Sorex obscurus obscurus Merriam.
3. Microsorex eximius (Osgood).
4. Myotis longicrus longicrus (True).
5. Mustela cicognani richardsoni Bonaparte.
6. Mustela vison energumenos (Bangs).
7. Peromyscus maniculatus borealis Mearns.
8. Neotoma cinerea saxamans Osgood.
9. Synaptomys borealis dalli Merriam.
10. Phenacomys intermedius Merriam.
11. Evotomys gapperi saturatus Rhoads.
12. Microtus drummondi (Audubon and Bachman).
13. Microtus mordax mordax (Merriam).
14. Ondatra zibethica spatulata (Osgood).
15. Zapus saltator Allen.
16. Zapus hudsonius hudsonius (Zimmermann).
17. Erethizon epixanthum nigrescens Allen.
18. Marmota caligata oxytona Hollister.
19. Marmota monax petrensis Howell.
20. Eutamias amoenus ludibundus Hollister.
21. Lepus americanus columbiensis Rhoads.

GENERAL ACCOUNTS OF THE MAMMALS

Sorex personatus personatus I. Geoffroy. Masked Shrew

Six specimens collected (nos. 32526, 32528–32530, 32543, 32552), three from Hazelton and three from Kispiox Valley. A female taken at Hazelton on June 7 contained nine embryos.

For identification of the three species of shrews collected, I am indebted to Dr. Hartley H. T. Jackson of the United States Biological Survey.

Sorex obscurus obscurus Merriam. Dusky Shrew

Twenty-two specimens from Hazelton (nos. 32527, 32531–32542, 32544–32551, 32788), six from Kispiox Valley (nos. 32553–32558), and eleven from Nine-mile Mountain (nos. 32559–32569). According to Jackson there are some specimens from each locality that show an approach to *Sorex setosus* Elliot in cranial characters.

On Nine-mile Mountain shrews were trapped on a steep slope just above timber line (4500 to 5000 feet altitude), in dense growths of veratrum, lupine, and grass.

Microsorex eximius (Osgood). Osgood Shrew

A specimen of *Microsorex* (no. 32570) that was collected near Hazelton on June 8 has been provisionally identified by Jackson as *M. eximius*. It measures in millimeters as follows: total length, 88; tail vertebrae, 28; hind foot, 10.

Myotis longicrus longicrus (True). Northwestern Long-legged Bat

Two specimens collected, one at Hazelton, June 18 (no. 32571), and one in Kispiox Valley, July 9 (no. 32572). The Hazelton specimen was found, freshly killed, on the ground under a telephone line. At that point the wire was strung through timber and not easily seen amid the trees, but even so it is noteworthy that this bat should have collided with it. The wire had struck the upper part of the breast and had cut through to the spine; the animal was all but cut in two.

The Kispiox Valley specimen was dislodged from a crack in the trunk of a dead poplar, felled for firewood. The first few blows of

the axe sent it fluttering out, quickly to take refuge in a similar crevice in a nearby tree. Small bats were seen occasionally up to August 21, but not many and always late at night.

Mustela cicognani richardsoni Bonaparte. Richardson Weasel

Five specimens taken (nos. 32573–32577), four males and one female, all from Kispiox Valley. These exhibit the cranial characters of *richardsoni,* as contrasted with the subspecies *alascensis* of the coast (see Merriam, 1896, p. 13). Besides skull variation, there are color differences distinguishing the forms in the summer pelage. The five Kispiox Valley specimens are of a dark, dull brown, close to raw umber, the underparts almost pure white. The *alascensis* series at hand (thirteen summer skins from the coast of southeastern Alaska), are more reddish, the brightest colored specimens close to auburn, and the underparts are often strongly tinged with yellow.

Weasels are probably fairly abundant in the region, for, besides those collected, others were seen at various times. On July 5 one was encountered in the daytime, carrying a freshly killed Drummond meadow mouse. The weasel dropped his prey and escaped in the tall grass; the meadow mouse on examination was found to have the marks of four tiny canine teeth, two in the base of the skull, above, and two in the neck just below the skull. Weasels sometimes took mice from our traps, and, acting on this hint, we were able to catch several in steel traps baited with mice or birds.

Mustela vison energumenos (Bangs). British Columbia Mink

One specimen (no. 32578, adult male) collected in Kispiox Valley, September 4. It is a dark-colored animal, similar to others at hand from the lower Taku River and Wrangell, Alaska, the upper Stikine River, and Seattle. (In this connection see Swarth, 1922, p. 163.)

Peromyscus maniculatus borealis Mearns.

Northern White-footed Mouse

Thirty-seven specimens collected near Hazelton (nos. 32579–32615), twelve in Kispiox Valley (nos. 32616–32627), and ten on Ninemile Mountain (nos. 32628–32637).

The series as a whole is so nearly intermediate between *Peromyscus maniculatus borealis* and *P. m. macrorhinus* that neither name is

satisfactory to use. There are some differences apparent between the series from the three different localities. Among the mice taken at Hazelton there is a preponderance of small, short-tailed, bright-colored specimens (*borealis*-like) and there are no large, long-tailed individuals. From Kispiox Valley and Nine-mile Mountain there are certain large, long-tailed, dark-colored specimens (*macrorhinus*-like), and there is none that is as near typical *borealis* as are some specimens in the Hazelton series. The darker colored mice differ from typical *macrorhinus* in their duller shades; they lack the rich brown apparent in coastal specimens of *macrorhinus*.

Skulls, also, in size and character are variously intermediate between *borealis* and *macrorhinus*. There is individual variation, notably in the series from Nine-mile Mountain, some skulls being generally long and slender, especially as regards the rostrum, others more short and broad.

The differences between the series from Hazelton and those from Kispiox Valley and Nine-mile Mountain are not obviously correlated with geographic position; for Hazelton, with the more *borealis*-like mice, is nearest the habitat of *macrorhinus*, and in a broad valley that leads direct to the coast.

Individual variation obtains in each series to a notable extent. Relative length of tail is a conspicuously variable feature, apparent as soon as the animals were handled. Other variations appeared upon closer study. It may be suggested that two distinct forms are represented in the series under discussion, but in contravention to this idea is the fact that the several distinguishing characters of either subspecies are not always uniformly developed in the same specimen. Size, color, length of tail, and character of skull, are the characters used in differentiating these races, and some individuals possess certain features more nearly like one subspecies, some that are more nearly like the other.

It will take many specimens representing numerous localities in northern and central British Columbia, to demonstrate the distribution and relationships of the forms of *Peromyscus maniculatus* occurring in that general region. In the northern interior of the province is *borealis*, on the northern coast is *macrorhinus*, at the southwest is *oreas*, and at the southeast, *artemisiae*. These subspecies are distinct enough at the centers of their respective ranges, but at the edges of their habitats there are many difficulties in the way of satisfactory allocation of specimens. It will require an immense amount of detailed work to

arrive at an understanding of conditions. Osgood (1909, pp. 50, 52, 59) has commented upon the situation and pointed out some of the difficulties. If, as he asserts, there are places where two subspecies occur together, each in typical form, the problem is even more involved than appears from my own material. I did not find this to be the case in the critical regions worked on the Skeena River or on the Stikine River (see Swarth, 1922, p. 164).

TABLE 2

Measurements in Millimeters (Average, Minimum, and Maximum) of Adult *Peromyscus*

		Total length	Tail vertebrae	Hind foot
Peromyscus m. borealis (10 spec.)	Telegraph Creek, B.C.	170.2 (158-192)	75.3 (65-105)	20.2 (19-22)
Peromyscus m. borealis (10 spec.)	Hazelton, B.C.	176.5 (170-186)	87.3 (75-95)	20.6 (19.5-22)
Peromyscus m. borealis (8 spec.)	Kispiox Valley, B.C.	192.8 (186-210)	97.0 (88-106)	22.0 (21-24)
Peromyscus m. borealis (10 spec.)	Nine-mile Mt., B.C.	190.0 (168-214)	99.0 (79-121)	22.1 (21-23)
Peromyscus m. macrorhinus (10 spec.)	SE. Alaska.	203.3 (197-218)	108.2 (104-116)	24.3 (23-26)

Neotoma cinerea saxamans Osgood. Northern Bushy-tailed Wood Rat

Seven specimens collected (nos. 32699–32705): three adults and two juveniles on Nine-mile Mountain; one adult and one juvenile in Kispiox Valley. They are indistinguishable from specimens from the Stikine River and all are apparently typical of the subspecies *saxamans*.

The local distribution of the bushy-tailed wood rat in this region presents some puzzling features. The animals are abundant in the mountains, where they are preëminently rock dwellers, and it is an easy matter to find sign of their presence in such surroundings. The valleys generally are covered with forest, with dense underbrush beneath the trees, and there are vast areas where no rock formation of any sort is to be seen. In such woods I was never able to find wood rat sign. In many places in these poplar-covered lowlands, however, ranching has been attempted, ground has been cleared and cabins

erected, and wherever a cabin is built the wood rats take prompt possession. Where they come from is not evident, their natural habitations in the poplar woods not being visible, but they are abundant enough to be a decided nuisance.

Synaptomys borealis dalli Merriam. Dall Lemming Mouse

One specimen (no. 32641) was trapped in a *Phenacomys* runway at the summit of Nine-mile Mountain (5500 feet altitude), on August 10. *Synaptomys andersoni* was described from the interior of British Columbia to the northward of this regon (Allen, 1903, p. 554), and *S. chapmani* from the Selkirk Range of southern British Columbia (Allen, 1903, p. 555), but there probably is not sufficient material extant anywhere to determine the validity of these species. The one lemming mouse at hand from Nine-mile Mountain did not seem to me sufficiently different from the specimens of *dalli* in the collection of the Museum of Vertebrate Zoology to justify the use of another name. Mr. A. Brazier Howell, to whom I forwarded the specimen, making comparison with more extensive series in the United States National Museum, came to the same conclusion.

Phenacomys intermedius Merriam. Kamloops Phenacomys

On the summit of Nine-mile Mountain the extensive masses of false heather (*Cassiope mertensiana*) were in places criss-crossed with well defined runways much like meadow-mouse paths in appearance. These runways occurred at scattered intervals, usually in patches of cassiope that were greener than elsewhere, as about the edges of snow banks or little lakes, and they favored also places where there were breaks in the ground, such as a little earth bank or some protruding rocks. They connected tiny holes that ran back into the ground or under rocks; here and there round nests were found, eight or ten inches in diameter, made of soft grass and moss, and not unlike birds' nests in appearance. At intervals there were piles of faeces, in extraordinary amount. Fresh faeces and green cuttings of grass and cassiope were evidence that the runways were in use, but trapping brought meager results. One *Phenacomys,* one *Synaptomys,* and one *Evotomys* was the sum total of two weeks' trapping. The runways I took to be the work of *Phenacomys,* for I had never found similar trails elsewhere where I had trapped the other two species that were taken here.

The specimen of *Phenocomys* above mentioned (no. 32639) was an adult male, taken August 28 at an altitude of about 5500 feet. Two young males (nos. 32638, 32640) were trapped on July 26 and August 11, respectively, in growths of lupine and veratrum just at timber line (about 4500 feet), near our camp.

I am indebted to Mr. A. Brazier Howell for the identification of these three specimens of *Phenacomys*.

Evotomys gapperi saturatus Rhoads.

British Columbia Red-backed Mouse

Found in small numbers in poplar woods at Mission Point, near Hazelton, where eight specimens (nos. 32642–32649) were trapped from June 2 to June 18. Trapping in similar surroundings in Kispiox Valley produced no red-backed mice. One specimen (no. 32650) was taken at the summit of Nine-mile Mountain, about 5500 feet elevation, in a *Phenacomys* runway.

I am indebted to Mr. A. Brazier Howell for the identification of this series of *Evotomys*.

Microtus drummondi (Audubon and Bachman).

Drummond Meadow Mouse

Seventeen specimens collected at Hazelton, twelve in Kispiox Valley, and one on Nine-mile Mountain (nos. 32651–32681). Apparently of general distribution in the lowlands, though not abundant at any point where we trapped. The single specimen from Nine-mile Mountain was caught in a tangle of grass and veratrum just at timber line, about 4500 feet altitude. It was the only one of the species that was seen at that point.

Microtus mordax mordax (Merriam). Cantankerous Meadow Mouse

Six specimens, four adult and two juvenile (nos. 32682–32687) trapped at timber line on Nine-mile Mountain. The species was not found in the lowlands. The four adults are distinctly dark colored as compared with *mordax* from the upper Stikine River, and while the series is too small for satisfactory comparison, it apparently illustrates intergradation between *mordax* of the interior and *macrurus* of the coast, such as we found in the meadow mice of the lower Stikine (see Swarth, 1922, p. 175).

Ondatra zibethica spatulata (Osgood). Northwestern Muskrat

Fairly common in Kispiox Valley, where three adults and eight young (nos. 32688–32698) were collected in August and September. These specimens are decidedly dark colored, compared with Alaskan skins, and are probably intermediate toward *osoyoosensis*. In external measurements also they are similarly intermediate according to the figures given by Hollister (1911, pp. 22, 25).

Zapus saltator Allen. Stikine Jumping Mouse

Twenty specimens collected near Hazelton, three in Kispiox Valley, and one on Nine-mile Mountain (nos. 32706–32728, 32731). All are adult. Our latest lowland capture of *Zapus* was on July 13, and up to that time apparently no young were yet born. No nursing females were caught, and only two that were pregnant, one taken on June 14 containing five small embryos, one on June 16, containing six. The one specimen from Nine-mile Mountain (adult female, July 27) was caught in a thick growth of veratrum just above timber line, at about 4500 feet altitude. It is small, compared with lowland specimens, but does not otherwise depart from the characters of *saltator,* and this small size may indicate nothing more than an extreme of variation in the species.

This series of *Zapus saltator* from the Skeena Valley, compared with a somewhat larger series from the upper Stikine Valley, presents no obvious points of difference. In each lot there is considerable variation in color, a number of specimens being noticeably grayish, as compared with a larger proportion of reddish-colored ones.

Zapus hudsonius hudsonius (Zimmermann).
Hudson Bay Jumping Mouse

Two specimens taken near Hazelton, an adult male on June 15, an adult female on June 18 (nos. 32729, 32730). These were caught in the same trap line with the more numerous *Zapus saltator*. They were submitted for identification to Mr. Edward A. Preble, of the United States Biological Survey, who remarks that he "cannot separate them from typical *hudsonius*." In this connection it is of interest to recall the capture by the present writer of a jumping mouse of the *Zapus hudsonius* group (tentatively identified as *Z. h. alascensis*), on Revillagigedo Island, Alaska (see Swarth, 1911, p. 135), which island is

about eighty miles north of the mouth of the Skeena River. Much collecting must be done, and in localities as yet unworked, before an understanding can be reached regarding the distribution and relationships of the species of *Zapus* occurring in the northwest, but certain ideas of Mr. Preble, expressed to me in a letter, seem to point so surely toward a solution of the problem, in its general features, that I append his comments here.

I believe *Z. saltator* to be related to *Z. princeps*, a supposition which is borne out in a measure by its distribution in northern British Columbia. There it supplements in some degree the Rocky Mountain distribution of *Z. princeps*, reaching the coast from the mouth of the Skeena northward. The *Z. hudsonius* group has evidently intruded into British Columbia from the east, being represented by the colony named *Z. tenellus*, and by your Hazelton specimens. Doubtless it covers a wide area. Your Revillagigedo Island (Portage Bay) specimen may represent an intrusion from the north, where *Z. hudsonius* (or *alascensis*) is common. *Zapus h. alascensis*, though recognizable in its typical form, is a rather faintly characterized subspecies, and the Portage Bay specimen, like the Hazelton ones, is very close to typical *hudsonius*.

Erethizon epixanthum nigrescens Allen. Dusky Porcupine

Porcupines were abundant at timber line on Nine-mile Mountain. The lowlands are doubtless visited frequently during the winter months, but in summer the species seems to be rather closely restricted to the Hudsonian Zone of the higher mountains. Rock slides, just above the limit of upright timber, evidently form the preferred habitat. The animals were numerous enough to be a decided nuisance. They are nocturnal for the most part, and but few were seen abroad in daylight; activities began at dusk, and during the three weeks we spent upon the mountain there was not one night when we were not disturbed by visiting porcupines.

Three specimens were preserved: no. 32755, skin and skull; no. 32757, skin and skull; no. 32756, complete skeleton. All are adult males. There was great variation in color among the animals we saw; the two skins preserved were taken as representing extremes of light and dark coloration. Number 32757 is very dark, black in general effect, and is doubtless the same sort of animal as served as the type of *Erethizon epixanthum nigrescens* Allen. Number 32755, yellowish in general appearance, is not to be distinguished in color from four California specimens at hand.

Porcupine skulls are said to exhibit great individual variation (see Hollister, 1912*b*, p. 27), but as far as our series goes, there are cranial characters which can be used to differentiate the animals of British

Columbia and California. In the skulls from British Columbia the nasals are short and the zygomata are rather evenly bowed for their whole length. The skulls from California have longer nasals, and straight, angular zygomata. In the four skulls from California, a straight edge (such as a rule) laid alongside the zygomatic arch will touch the bone for distances of from 20 to 33 millimeters. In the skulls from British Columbia the contact is from 10 to 15 millimeters. There is not much individual variation among the specimens in each series, the four skulls from California, on the one hand, and the three from Nine-mile Mountain on the other. Porcupines from the coast of southeastern Alaska have skulls that most nearly approach the British Columbia type of structure. One from Telegraph Creek, upper Stikine River, is closely similar to the specimens from Nine-mile Mountain.

Marmota caligata oxytona Hollister. Robson Hoary Marmot

Abundant on Nine-mile Mountain, at timber line and higher. Occupied burrows were mostly in the rock slides, but not invariably so. Some were found on sunny slopes that were not especially rocky, one or two in dense spruce woods (not far from openings), and a number that were hidden in thickets of prostrate balsam above the limit of upright timber. Young marmots, a quarter-grown or less, were seen during the last week in July. Two such youngsters with their parent were in view daily at the mouth of a burrow a stone's throw from our camp.

Five marmots (nos. 32760–32764) were collected, three adult males and two young females. Besides these I examined eight or ten Indian robes made of about thirty marmot skins each, all from animals killed in the general vicinity of Hazelton. Skins from this region are dark colored ventrally, compared with average *caligata* from the coast of Alaska, and, in the five specimens from Nine-mile Mountain, there is almost complete elimination of the white mark found between the eyes in *caligata*. Otherwise, marmots from the Hazelton region are not markedly different from *caligata* in coloration. The skulls of the specimens from Nine-mile Mountain show the elongation attributed to *oxytona* (Hollister, 1912*a*, p. 1; Howell, 1915, p. 63), as compared with the broader skull of *caligata*. Thus marmots from the Hazelton region appear to be intermediate between *caligata* and *oxytona*, much like the former in general coloration, like the latter in skull characters.

Marmota monax petrensis Howell. British Columbia Woodchuck

A resident of the lowlands of the Hazelton region; possibly common but, from its shyness and the nature of its surroundings, difficult to see. We collected two specimens in Kispiox Valley, all that we encountered, and were told of several others seen nearby. The two collected were an adult female (no. 32758), taken August 21, and a male of the previous year (no. 32759), on September 8. The year following our visit to the region four additional specimens (nos. 32965–32968, three males and one female), were sent me by an acquaintance, Mr. Charles Lindahl, who shot them at the same locality, in May, 1922.

TABLE 3

Measurements in Millimeters of Skulls of *Marmota monax petrensis* from Kispiox Valley, B. C.

		Condylo-basal length	Palatal length	Post palatal length	Length of nasals	Zygo-matic breadth	Breadth across mas-toids	Least inter-orbital breadth	Breadth of rostrum	Maxil-lary tooth row
32758	♀	81.8	48.5	30.0	31.5	56.0*	39.8	21.0	16.0	19.2
32968	♀	80.3	47.8	29.8	32.5	55.0	39.5	20.0	14.8	20.0
32759	♂	75.8	45.2	27.0	31.2	53.8	38.2	19.0	14.2	18.5
32965	♂	85.0	50.0	30.5	34.0	56.8	40.5	21.2	15.2	19.0
32966	♂	82.5	49.0	29.0	32.0	57.0	40.0	20.2	14.0	19.2
32967	♂	78.5	46.0	29.0	30.5	55.0	40.0	20.0	15.0	21.0

*Estimated.

Howell (1915), upon the basis of skulls without skins, ascribes to *Marmota monax ochracea* a range extending south to the Babine Mountains and Stuart Lake, a little southeast of the place where we were collecting. Our specimens, however, are not *ochracea;* in color at least they are widely different from that subspecies. Five of the six are almost uniformly black. The one in 'normal' pelage is in markings closely similar to a Wisconsin specimen of *rufescens* at hand, though darker colored throughout; it has not the cinnamon-colored tail of *ochracea.*

The five black skins came all from the same small clearing on the Kispiox River, but nevertheless the melanism exhibited by them is not to be regarded as peculiar to a limited strain, a single family group. We were told by several people that most of the lowland woodchucks of this general region were black, and that it was only an occasional one that showed the yellow-brown type of coloration. Of

the five black skins, the four taken in May are black throughout save for a more brownish appearance upon the head. The September skin has an infusion of chestnut on neck and shoulders, and scattered white hairs elsewhere.

We had slight opportunity of observing the habits of this woodchuck, but we were told that the preferred habitat was in clearings, such as were afforded by abandoned ranches. All our specimens came from such places.

Eutamias amoenus ludibundus Hollister.

Canadian Mountain Chipmunk

Occurs in small numbers in the vicinity of Hazelton. Chipmunks came to the barns and corrals at Mission Point, where we were camped, in fair abundance, attracted by the scattered grain, and they were seen also in the burned over areas toward Rocher Déboulé, but they were absent from the dense woods that cover most of this region. None was seen in Kispiox Valley nor on Nine-mile Mountain.

Five specimens were collected (nos. 32732–32736). These were identified by Mr. A. H. Howell, of the United States Biological Survey.

Sciurus hudsonicus picatus Swarth. Northwest Coast Red Squirrel

Twelve red squirrels were collected near Hazelton, five in Kispiox Valley, and one on Nine-mile Mountain (nos. 32737–32754). The squirrel of this region, as exemplified in the series collected, is referable to the coastal subspecies *picatus;* in just one specimen (no. 32742, Hazelton, June 6) is there shown any intergradation toward *hudsonicus,* of the interior.

Squirrels collected about Hazelton during the last week in May, one even as late as June 2, were in winter pelage throughout; one taken on June 16 was in complete summer pelage. Squirrels in the lowlands had entirely finished the molt by the end of June. One that was shot at timber line (4000 feet) on Nine-mile Mountain on August 2 was about midway through the change. (For the use of the name *Sciurus hudsonicus picatus* see Swarth, 1921, p. 92.)

Lepus americanus columbiensis Rhoads.

British Columbia Varying Hare

Twenty-two specimens collected (nos. 32765–32786): sixteen summer adults (skins with skulls), four juveniles, one skeleton (without skin), and one flat winter skin without skull (the gift of an acquaintance). This series seems with fair certainty to belong to the subspecies *columbiensis* (though collected far north of the known range of that form), judging from the characterization of the northwestern hares given by Nelson (1909), and from the appearance of a single specimen (no. 33412), an adult female, taken at Vernon (the type locality of *columbiensis*), November 6, 1922. Specimens from the Hazelton region are essentially like this topotype of *columbiensis*, due allowance being made for seasonal difference. The Skeena Valley hares are small for *macfarlani*, occurring immediately to the northward (see table of measurements), and, also, in summer pelage the feet are brown. According to Nelson (*op. cit.*, pp. 49, 50, 86), in *macfarlani* the feet in summer pelage are white, in *columbiensis* they are brown.

Considerable field work and study is still required to arrive at an understanding of the distribution of the species of *Lepus* in British Columbia. Thus, the type locality of *Lepus americanus columbiensis* is Vernon, British Columbia. Nelson records *L. a. columbiensis* from Vernon (1909, p. 104), and *L. bairdi cascadensis* from 'Okanagan' (*op. cit.*, p. 114). Vernon and Okanagan are practically the same locality, Vernon being the principal town in the Okanagan Valley. There is no town of Okanagan, though there is a locality called Okanagan Landing some four miles south of Vernon. Thus Nelson in his text has *L. bairdi cascadensis* and *L. americanus columbiensis* occurring at the same place; in the map of the ranges of these animals (*op. cit.*, p. 85, fig. 8) they are not shown to overlap. If the two forms actually do occur together in any one locality it is a matter of some importance, as bearing upon their specific distinction (see Nelson, *op. cit.*, pp. 84, 85).

There is at hand a specimen of *Lepus* (no. 32789), an adult female, collected by the writer near Okanagan Landing, October 1, 1921, that differs in color and skull from the Hazelton hares and from the specimen from Vernon referred to above, and it is apparently *Lepus bairdi cascadensis*. There may be local differences of environment

separating the two species in this region, or their ranges may really overlap for some distance. More data are required to establish the actual conditions.

We happened to visit the Skeena Valley in a "good rabbit year" and the animals were abundant everywhere in the lowlands. None was seen at high altitudes. In the poplar woods the ground was conspicuously crisscrossed with rabbit trails, and these trails were in constant use. The rabbits themselves were most often encountered about dusk; at that time, too, in a walk through the woods there could be heard again and again the resounding thumps of rabbits' feet, as the startled creatures fled unseen. This alarm note, usually

TABLE 4

MEASUREMENTS IN MILLIMETERS OF *Lepus americanus columbiensis* FROM THE UPPER SKEENA VALLEY, B. C.

		Total length	Tail vertebrae	Hind foot	Ear from notch
32776	♂	438	46	130	76
32778	♂	450	58	133	70
32779	♂	420	42	130	77
32782	♂	451	45	132	65
32777	♀	466	55	138	75
32780	♀	439	41	130	70
32785	♀	445	40	133	70

repeated many times, presumably serves some good purpose, but it seemed as though in this region it could act only as a guide for some pursuing horned owl that otherwise would have had difficulty in following its prey through the bushes.

By the middle of June young rabbits were seen in some numbers, but we found it impossible to shoot them. They were much more active than the adults, and in the tangles of windfall and brush where we saw them, usually close underfoot, they could dart under cover with amazing speed. The juveniles collected were all trapped.

Adults taken early in June still retained some of the white winter pelage. One collected on June 6 is pure white below, the feet are white (with pale cinnamon under-fur), and there are scattered white hairs on the rump and sides. The white lingers longest upon the feet, traces being seen even upon one or two rabbits that were shot in July.

Pregnant females taken on June 1, June 12, and July 11, contained, respectively, eight, one, and five embryos.

By the middle of August rabbits were noticeably less abundant than they had been a month earlier. Then, too, we began to find them dead in the trails, evidently from some disease. It seemed apparent that they were beginning to suffer from the ravages of the epidemic that periodically reduces the northern rabbits, though from all accounts their numbers locally had not yet reached the maximum that was to be expected. This was but the second year of increase since the last period of scarcity, we were told.

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EXPLANATION OF PLATES

PLATE 9

Rocher Déboulé Mountain from Hazelton; the Bulkley River in the foreground. Photograph taken September 26, 1921.

PLATE 10

Fig. 1. Woods and clearing in Kispiox Valley. *Marmota monax petrensis* was found in the meadow here shown. Photograph taken September 10, 1921.

Fig. 2. Ridge at the summit of Nine-mile Mountain, about 5000 feet altitude. The thickets are of dwarfed white fir and mountain hemlock. Habitat of caribou and marmot, of ptarmigan, pipit, and golden-crowned sparrow. Photograph taken July 29, 1921.

Fig. 1

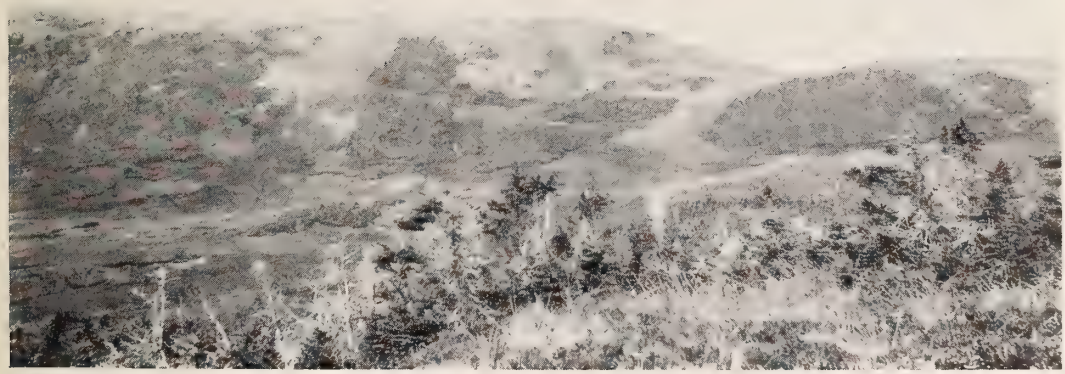

Fig. 2

PLATE 11

Fig. 1. Rock slides at timber line (about 4500 feet altitude), on Nine-mile Mountain. The expedition's camp was located in the tongue of timber extending up the slope in the middle distance. These rocky mountain slides are the preferred habitat of marmot and porcupine, fox sparrows inhabit the thickets, and the Fleming grouse is found at the edge of the big timber. Photograph taken July 25, 1921.

Fig. 2. Upper edge of spruce and hemlock forest at about 4500 feet altitude on Nine-mile Mountain. In these woods (Hudsonian zone) were found Franklin grouse, white-winged crossbill, Hudsonian chickadee, mountain chickadee, and hermit thrush. Photograph taken July 30, 1921.

Fig. 1

Fig. 2

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